THE CHEMIST AND DRUGGIST

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PRESCRIPTIONS BY CHEMISTS AND DRUGGISTS.

The constantly increasing applications from correspondents for information with respect to "the right of chemists and druggists to prescribe," have induced us to direct special attention to this important subject in its legal bearings. At present, although our own comment may be to some extent unavoidable, we propose to confine ourselves chiefly to pointing out the simple law of the case, leaving for future consideration the doubts which may arise thereupon. At the same time, some slight reference to the history of the trade will be necessary, in order to render the law intelligible, but this reference may be condensed into a few sentences.

There can be no doubt that previously to the Apothecaries' Act, 1815, not only were chemists and druggists allowed to minister to the ailments of their customers by selling medicaments, simple or compounded, upon the prescription of the sellers, but any person choosing to practise as an apothecary was allowed so to do under no more restraint than is now imposed upon the business of an oilman. The starved apothecary of Shakespere's *Romeo and Juliet* was, doubtless, drawn from an English type. Butler, in his *Hudibras*, speaks of such an apothecary, whose shop was

> "— Stored with deletery med'cines,
> Which whosoever took is dead since."

Johnson defines an apothecary as a "man whose employment is to keep medicines for sale;" and he also describes a druggist as "one who sells medicinal drugs," translating the word "drug," moreover, as "an ingredient used in physic, a medicinal simple." From his explanation of "Chemist"—(see *Chymist*), "a philosopher by fire," the enquirer does not gain much. By the preamble to the Apothecaries' Act, we gather that the qualifications of an apothecary of the City of London might, from the time of the charter granted the Company by James the First, consist of his being skilful in the art or mystery, "and a freeman of the Grocers or any other art, mystery, or faculty in the City;" but the prohibitory clauses in the charter appear only to have related to the City and seven miles round. And after the various prohibitions in the Apothecaries' Act (1815) we find, sec. 28, "That nothing in this Act contained shall extend or be construed to extend to prejudice or in any way to affect the *trade* or *business* of a chemist and druggist in the buying, preparing, *compounding*, *dispensing*, and vending drugs, medicines, and medicinable compounds, wholesale and retail." We have here italicised certain important words. It will be seen that while an apothecary's business has been described as an "art, mystery, or faculty," that of the chemist and druggist is set forth as a "trade or business." To compound is (Johnson) "to mingle many ingredients together into one mass;" to dispense, in this signification, "to make up a medicine." Hence the right of chemists and druggists to sell medicines, whether simple or compounded, and, moreover, the right to "compound" or "dispense" such medicines, is indisputably confirmed. Consequently this Act, by admitting the chemist and druggist to sell these goods, leaves him to his common law right of recovering payment for them. But the section proceeds, "But all persons using or exercising the said trade or business, or who shall or may hereafter use or exercise the same, the same shall and may use, exercise, and carry on the same trade or business in such manner, and as fully and amply to all intents and purposes, as the same trade or business was used, exercised, or carried on by chemists and druggists before the passing of this Act." Now we direct especial attention to this second portion of the section; to cover the mere mixing and selling of medicines the first part would have been clearly sufficient. Something more is intended by this iteration, which, *totidem verbis*, authorises the carrying on *as theretofore* of the trade or business of a chemist and druggist. How that trade or business had been theretofore carried on becomes therefore a matter of serious inquiry. Let us first look into the interpretation taken of it by the Apothecaries' Company itself. To this Company is given the sole but transferable right of suing for penalties under the Act. We may consider them, using the word in its political and non-offensive sense, as the monopolists of their Art or Mystery. By the circular issued by the Company to all applicants, which contains the essential grounds of prosecution for penalties, we quote the following: —"The first point therefore to establish in each case of practice, is the nature of the disease. Next that the defendant *attended the patient*, and prescribed and supplied medicines for his cure or relief; and lastly, that *the attendance* and supply of medicines were with a view to gain. Again, we find that proof is required that 'the defendant gave no intimation that his services were gratuitous.' Hence we perceive that an intimation to this effect will, in the opinion of the Apothecaries,—the plaintiffs be it remembered,—protect the defendant from trouble at their hands. There can be nothing easier than to print upon the bill-head which every customer receives from his chemist and druggist, 'No charge for medical attendance.' The same notification might be exposed—say in a glass frame, in the shop."

The apothecaries' view being thus clear,—that *exclusively of the saving clause* relating to chemists (we will henceforth use the one term instead of the two, *brevitatis gratiâ*), *no person* is to be prosecuted under their Act *who does not charge for attendance*,—it may well be asked, "Why the saving clause at all, if no further privilege is to be conferred upon the parties for whose express benefit it is enacted?"

Fortunately, the date of the Apothecaries' Act (1815) is not of such antiquity as to preclude the proof from living memory of what was the Chemist's business before that time. Many of our readers will, from personal knowledge, be able to confirm that which we learn from enquiry, that before this date the Chemist was in the constant practice of listening to his patients' description of their ailments, and of supplying medicines, prescribed by himself, for their relief. If not, we repeat, "Why the clause which we have before recited?" But this oral evidence is in its nature fleeting, and the hope of obtaining it must be daily decreasing. But here is the Pharmaceutical Society's definition of the term, extracted from the first volume of the *Pharmaceutical Journal*:—"The term" (Chemist and Druggist) "shall be held to mean a person who has been apprenticed to, or regularly educated by a vender of drugs or dispenser of medicines, but who does not profess to act as a visiting Apothecary or Surgeon." And this definition is, to no slight extent, authoritative.

Now, we certainly agree with this principle, that a Chemist has no right to leave his shop to attend upon any invalid, the "saving clause" notwithstanding. To do so is not his "trade or business." Nor do we think he has any right to charge for medical attendance, even in his own shop. We reserve, however, for a future article, our views upon the effect of the New Medical Act, in which we will at present only add that a similar saving clause appears.

It is, moreover, our intention, as speedily as possible, to lay the correspondence we have received, together with this article, and any useful statements with which our subscribers may forward to us in time, before an eminent counsel, whose carefully considered opinion we trust to be enabled to lay before our readers in our next.

ANALYSIS OF MANURES.

BY DR. HENRY M. NOAD, F.R.S.

GUANO.

The almost universal use of this complex manure, its high price, and the consequent inducement held out to unprincipled vendors to sophisticate it, renders it a matter of importance that the real value of a sample, as a fertilizing agent, should be capable of being tested, without submitting it to the costly and tedious process of an elaborate analysis. "Impositions," says Professor Johnston,* "have been practised on unwary farmers, by selling as genuine guano artificial mixtures, made to look so like guano that the practical man in remote districts is unable to detect it. A sample of such pretended guano, which had been sown in the neighbourhood of Wigtown, and had been found to produce no effect upon the crops, was lately examined in my laboratory, and found to contain, in the state in which it was sold, more than half its weight of *gypsum*, the rest being *peat* or *coal ashes*, with a little common salt, sulphate of ammonia, and either dried urine or the refuse of the glue manufactories, to give it a smell. I could not satisfy myself that it contained a particle of real guano." . . . . . . Again, he says, "Four vessels recently sailed hence (Liverpool) for guano stations, ballasted with gypsum (plaster of Paris); this substance is intended for admixture with guano, and will enable the parties to deliver from the vessel a nice looking and light coloured article. Parties purchasing guano are very desirous of having it delivered from the vessel, as they believe that they thereby obtain it pure. The favourite material for the adulteration of guano is *umber*, which is brought from Anglesea in large quantities. The rate of admixture, we are informed, is about fifteen cwts. of umber to about five cwts. of Peruvian Guano, from which an excellent looking article, called African Guano, is manufactured."

Guano (proper) is the dung of the innumerable sea-fowl, which from time immemorial have frequented the rocks and islands along the coast of South America and other tropical countries; it forms layers of varying thicknesses, and is decomposed with extreme slowness, partly in consequence of the extraordinary dryness of the atmosphere, and partly from the more ancient deposits being thickly covered with drift sand. Its recognised value as a manure is by no means of recent date. The *Incas* of Peru highly appreciated it, guarding the sea-fowl with great care, and making the killing of one a capital offence; indeed it would seem to be absolutely necessary to the cultivation of the land in Peru. It is, however, rapidly diminishing; the access of foreign shipping, and the want of proper protection, have driven away many of the sea-fowl, and lessened, to a very great degree, the production of the recent guano. The quality of guano, even when genuine Peruvian, is very variable; some samples yielding only seven per cent. of ammonia, whilst others are said to give as much as twenty-five per cent.; its variation in the proportions of sand and fixed saline matter, is quite as considerable.

According to Denham Smith (Proceedings of the Chemical Society, vol. ii.), South American Guano as imported presents itself in three distinct states, the three varieties being not unfrequently mixed together in the same bag: the first variety is damp and pulverulent; the second exists as large concretions, presenting various aspects when broken; the third is heavy and crystalline, and is termed "stone" by the labourers. These three varieties differ widely in composition, as the following comprehensive analysis, by Smith, will show :—

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* Elements of Agricultural Chemistry.

Soluble in Water.	I. Pulverulent.	II. Concrete.	III. Saline.
Water	222·00	250·00	97·00
Muriate of ammonia	25·50	..	30·30
Sulphate of potash	80·00	..	..
Sulphate of soda	traces	258·44	191·77
Oxalate of ammonia	74 00	93·90	..
Oxalate of soda	..	..	105·63
Phosphate of ammonia	63·30	61·24	..
Phosphate of potash	..	77·32	49·47
Phosphate of soda	1·20	..	3·60
Chloride of sodium	..	29 22	286·31
Chloride of potassium	..	..	41·63
Organic matter	15·00	6·68	25·53
Urate of ammonia	154·18	..	..
Uric acid	25·16	..	..
Ammonia phosphate of magnesia	5·64	7·84	1·33
Animal matter	11·80	8·60	7·56
Insoluble in Water.			
Oxalate of lime	25·60	109·58	..
Phosphate of lime	199 30	62·70	132·23
Phosphate of magnesia	20·30	8·74	25·80
Oxide of iron	..	..	1·56
Humus and organic matters	60·92	8·00	18·36
Sand	15·60	7·20	4·20
Loss	·50	10·54	7·78
	1000·00	1000·00	1000·00

Several of the South American guano beds are now exhausted, but new varieties are constantly being introduced; and although the qualities are continually varying, guanos, on the whole, may be divided into two classes, the one characterized by the abundance of *ammonia*, the other by that of *phosphates*, the *Peruvian* and *Angamos* being characteristic of the former, and the *Saldanha Bay* and *Bolivian* of the latter. In selecting a guano, the following points (Anderson) ought to be attended to by the farmer :—

1st. The guano should be light coloured and dry, cohering very slightly when squeezed together, and not gritty.

2nd. It should not have too powerful an ammoniacal smell, and should contain lumps which, when broken, appear of a paler colour than the powder.

3rd. A bushel should not weigh more than from 56 to 60 pounds.

These characters are, however, imitated with great skill, so that they cannot be implicitly relied upon, and they are applicable to Peruvian guano only. The following are the chief adulterations in guano, which chemical analysis alone can detect :—A sort of *yellow loam*, very similar in appearance to guano, *sand*, *brick-dust*, *chalk*, *umber*, *gypsum*, *common salt*, and occasionally also, ground *coprolites* and inferior guano. These substances are rarely used singly, but are commonly mixed in such proportions as most closely to imitate the colour and general appearance of the genuine article. The adulteration always takes place in large towns, because it is only there that facilities exist for obtaining the necessary materials, and carrying it out without exciting suspicion. "The sophisticated article," observes Anderson,* "then passes into the hands of the small country dealers, to whom it is sold with the assurance that it is genuine, and analysis quite unnecessary. In other instances, adulterated and inferior guanos are sold by the analysis of a genuine sample; and sometimes an analysis is made to do duty for many successive cargoes of a guano which, though all obtained from one deposit, may differ excessively in composition. In order to insure obtaining a genuine guano, it is, above all things, important to deal with a person of established character, who will generally, for his own sake, satisfy himself that the article he vends is genuine and of good quality; and it is always important that the buyer should examine the analysis, and, in all cases where there is the slightest doubt, should ascertain that the bulk sent corresponds with it. In the case of a Peruvian guano, a complete analysis is not necessary for this purpose; but an experienced chemist, by the application of a few tests, can readily ascertain whether the sample is genuine. Where the difference in value between different samples is required, a complete analysis is necessary, and this is indispensable in the case of inferior guanos."

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* Elements of Agricultural Chemistry.

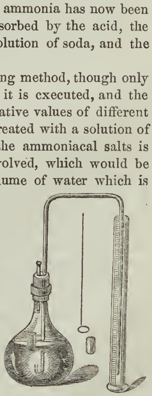
Analysis.—The following points should be attended to in the chemical examination of this manure, the sample being mixed as uniformly as possible, and kept in a well stoppered bottle:—

I. *Determination of the water.*—Dry 100 grains in the water oven (fig. 7, vol. i. p. 127) till it ceases to lose weight. A great difference is here found, even in genuine guanos, the margin extending from 7 to 20 per cent.

II. *Determination of total amount of fixed constituents.*—Incinerate 50 or 100 grains, at a low red heat, in a porcelain or platinum crucible, till the weight remains constant; the residue (which will, of course, vary greatly according as the guano is ammoniacal or phosphoric) should be white or grey; a yellow or red colour indicates a probable adulteration with *loam, brick-dust,* or *sand.*

III. *Determination of the total amount of Ammonia.*—In the first volume of this Journal, p. 391, we described various methods of analysing ammoniacal salts; amongst others, the alkalimetrical method of Peligot, which gives excellent results; it involves, however, the operation of distillation. This is obviated by the following modification of the process, which is particularly applicable to the analysis of guano, and ammoniacal manures generally. A weighed quantity (say 20 grains) of the guano is placed in a shallow glass vessel, about four inches in diameter, standing in a plate filled with mercury; on a glass triangle, laid across the dish containing the guano, is laid a second dish, containing a measured volume of standard sulphuric acid (see vol. i. p. 360); a few drachms of water are then thrown on the guano, and then some milk of lime, by means of a pipette; the whole is now covered with a beaker, and allowed to remain for two or three days, or until reddened litmus paper is no longer affected when introduced within the glass. The whole of the ammonia has now been expelled from the guano without the aid of heat, and has been absorbed by the acid, the quantity of which left free is determined by means of a standard solution of soda, and the amount of ammonia calculated from the result.

IV. *Determination of the Total Amount of Nitrogen.*—The following method, though only an approximative one, recommends itself by the facility with which it is executed, and the rapidity with which it enables the operator to ascertain the comparative values of different specimens of guano. It is founded on the fact, that when guano is treated with a solution of *chloride of lime,* the nitrogen both of the organic matter and of the ammoniacal salts is evolved as gas. Instead of collecting and measuring the gas evolved, which would be scarcely practicable on account of the violent effervescence, the volume of water which is expelled by the gas is ascertained by means of the simple apparatus represented in the figure; it consists of a flask capable of containing about half a pint, provided with a narrow gas delivery tube, bent twice at right angles. One limb, rather the shorter of the two, is passed air-tight through the cork of the flask, and bent upwards, to prevent as far as possible the escape of bubbles of gas. This tube descends nearly to the bottom of the flask. A second very narrow short tube is also passed through the cork, and serves for the escape of air when the cork is introduced. The longer limb of the delivery tube dips into a tall cylinder or tube, which is graduated to cubic centimetres or cubic inches. This flask is half filled with solution of chloride of lime, carefully prepared and kept in a dark place in a closed vessel.* About fifteen or twenty grains of guano are then weighed in a small glass



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* As the solution must contain an excess of hydrate of lime, it need not be perfectly clear.

vessel, which may be the end of a test tube, in which a few small shot have been placed in order that it may float. With the aid of the handle of iron wire shown in the figure, the tube is let down so as to float upon the surface of the solution of chloride of lime; the cork with the tube is then tightly adjusted, the orifice of the smaller tube closed with wax, and the flask shaken so that the little vessel may fill and sink. A volume of liquid, equal to that of the nitrogen evolved from the guano, then flows into the graduated cylinder; when no more liquid passes over, the cylinder is depressed so as to bring the liquid to the same level as that in the generating flask. The wax plug is then removed, the cork withdrawn, and the liquid still contained in the delivery tube is allowed to run into the cylinder, where the whole is carefully measured. Fifteen grains of good Peruvian guano evolves between four or five cubic inches of gas.

V. *Determination of Constituents, soluble and insoluble, in Water.*—Digest 150 or 200 grains with several times its volume of water; throw on a previously dried and weighed filter, and wash till a few drops of the washing water collected in a test-tube are not rendered turbid by adding chloride of calcium and ammonia. The filter with the washed guano is then thoroughly dried in the water oven and weighed. The difference, *less* the proportion of water found in I., gives the amount of soluble constituents. Burn the insoluble matter, and weigh the ash, which represents the amount of fixed soluble salts.

VI. *Sand.*—Dissolve the ash obtained in III. in dilute hydrochloric acid; if it effervesce *strongly*, there is reason to suspect an adulteration of *chalk*, as good guano only gives rise to a slight effervescence. The residue, after being well washed, dried, and gently ignited, is weighed as sand; it should not exceed 2 per cent.

VII. *Determination of Phosphate of Lime.*—On adding slight excess of ammonia to the hydrochloric solution of the ash, this salt falls; it is filtered off, washed, dried, ignited, and weighed. The filtrate from the precipitate by ammonia should give, on the addition of oxalic acid, only slight indications of *lime*. If, however, a considerable precipitate occurs, the guano has been certainly adulterated with chalk, the amouut of which must be determined.

VIII. *Determination of Alkaline Salts.*—It is only necessary for practical purposes to evaporate the filtrate from the phosphate of lime to dryness, and to weigh the residue after gentle ignition, to expel the ammoniacal salts, calculating it as "alkaline salts." When, however, *chalk* has been found as an adulteration, it must, of course, be previously removed by oxalic acid. By way of reference we append some analyses of the highest and lowest qualities of some *genuine* guanos of most importance, on the authority of Professor Anderson.

	Angamos.		Peruvian.		Bolivian.	
	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.
Water	12·60	7·09	10·37	21·49	11·53	16·20
Organic Matter and Ammoniacal Salts	65 62	50·83	55·73	46·26	11·17	12·86
Phosphates	10·83	8·70	25·20	18·93	62·99	52·95
Alkaline Salts	7·50	16·30	7·50	10·64	9·93	13·83
Sand	3·45	17·08	1·20	2·68	4·38	4·16
	100·00	100·00	100·00	100·00	100·00	100·00
Ammonia	25·33	17·15	18·95	14·65	1·89	2·23

Here is the composition of (so-called) first class Peruvian Guano, which has evidently, however, been adulterated, and which is worth less than half the price of the genuine article.

Water	12·06
Organic Matter and Ammoniacal Salts	34·14
Phosphates	22·08
Gypsum	11.08
Alkaline Salts	12·81
Sand	7·83
	100·00
Ammonia	9·77

The importation of guano into this country commenced in 1840, in which year a few barrels of it were brought over; from that time its importation has increased with great rapidity, so that at the present time there are imported and retained for home consumption a quantity exceeding 240,000 tons a year. It is impossible to imagine that this vast supply can be maintained, and it is therefore a matter not unworthy of the attention of chemists to consider whether a manure similar, or of equal efficiency to guano, may not be made artificially at a reasonable cost, and in such abundance as to place it within the reach of all. The following mixture was proposed by the late Professor Johnston:—

315 lbs. (7 bushels) of bone dust, at 2*s*. 9*d*. per bushel	£0	19	0
100 lbs. of sulphate of ammonia, containing 35 lbs. ammonia	0	18	0
5 lbs. of pearl ash	0	1	0
100 lbs. of common salt	0	2	0
11 lbs. of dry sulphate of soda	0	1	0
531 lbs. of *artificial guano* cost	£2	1	0

The quantity here indicated may be intimately mixed with 100 lbs. of chalk, and would, in the opinion of this eminent agricultural chemist, be equal in efficacy to 4 cwt. of fair ordinary guano.

THE NATURAL ORDERS OF PLANTS.

Cucurbitaceæ—The Gourd or Cucumber Order.

The plants of this order are natives of hot climates in almost every part of the world, but especially abound in the East Indies. Several are natives of the Cape of Good Hope, and many occur in Peru and Brazil; a few are found in Europe and North America, and one species only, the Bryonia dioica, in the British Isles. They consist of herbs, having tuberous or fibrous roots, which are annual or perennial. The stems are generally succulent, and either prostrate, or climbing by means of tendrils Those which are annuals readily bear the climate of northern latitudes during the summer, and are commonly cultivated in European gardens. The order comprises about sixty-five genera, and more than three hundred species, and is a member of the class Exogens, sub-class Calycifloræ.

Botanical Characters.—The leaves are succulent, usually palmated, or with palmate ribs, and covered with numerous asperities. The flowers are unisexual, monœcious (having the male and female organs in distinct flowers upon the same plant), or diœcious (having the male flowers on one plant and the female upon another), white, red, or yellow, and occasionally small and herbaceous. The calyx (outer floral covering) is monosepalous (the divisions of the calyx more or less united), five-toothed, the limb (the flat expanded part of the calyx) sometimes obsolete; in the female flowers superior. The corolla (inner floral covering) is monopetalous (the divisions more or less united), four or five parted, sometimes fringed, with strongly marked reticulated veins, perigynous (adherent more or less to the calyx, so that its position, as regards the pistil, is somewhat lateral), and sometimes scarcely distinguishable from the calyx. In the male, or barren flowers, the stamens (male organs) are usually epipetalous, either distinct, or monadelphous (having the filaments united together into one bundle), or triadelphous, in such a way that two of the bundles contain two stamens each, and the other but one; rarely only two or three stamens are present. The anthers (cellular cases on the apex of the stamen, inserted upon the filament) are two-celled, usually long and sinuous (bending in and out), rarely straight. In the fertile, or female flowers, the ovary (lower part of the pistil or female organ inclosing the ovules) is inferior, one-celled, or spuriously three-celled, from the projection inwards of the placentas (the place or part to which the ovules are attached), which are usually three, and parietal (proceeding from the interior surface or walls of the ovary). The style (that part which connects the stigma and ovary) is short, and the stigmas (that part of the female organ which receives the pollen) thickened, papillose lobed, or fringed. The fruit is a pepo, as in the Cucumber, or, rarely, a succulent berry, as in the Bryony. The seeds are more or less flattened, usually with a leathery or horny skin, solitary, or numerous. The embryo exalbuminous.

Diagnosis.—They are thus described by Professor Bentley:—"Herbs, usually of a succulent nature. Leaves rough, alternate, radiate veined. Flowers unisexual. Calyx five-toothed or obsolete, superior. Corolla monopetalous, perigynous. *Sterile flower*, with usually five stamens, which are distinct, or monadephous or triadelphous, epipetalous, rarely two or three stamens; anthers long, and usually sinuous. *Fertile flower:* ovary inferior, with parietal placentas. Style short. Stigmas more or less dilated. Fruit succulent. Seeds flat, exalbuminous; cotyledons leafy."

Distinction from Allied Orders.—From *Passifloraceæ*, the Passion Flower order, by their sinuous stamens, adherent ovary, unisexual flowers, and exalbuminous seeds. The order is divided into the three following sub-orders:—

Sub-order 1. *Nhandirobeæ.*—Anthers not sinuous. Placentas projecting, so as to meet in the centre of the fruit. Seeds numerous. Exs. Telfairia, Feuillæa, Zanonia.

Sub-order 2. *Cucurbiteæ.*—Anthers sinuous. Placentas projecting, so as to meet in the centre of the fruit. Seeds numerous. Exs. Bryonia, Cucumis, Ecbalium.

Sub-order 3. *Siceæ.*—Placentas not projecting. Seed solitary, pendulous. Exs. Sechium, Sicyos.

General Properties.—The presence of an acrid bitter purgative principle is one of the chief characteristics of the plants belonging to this order. This property is found, more or less active, in every part of the plant, except the seeds (but even they are sometimes noxious); mildly in the roots of some, and in the leaves and young shoots of others, but in the greatest intensity in the pulp surrounding the seeds. Although furnishing us with edible fruits, as the Cucumber, Melon, Vegetable Marrow, &c., the plants of the order must be regarded with suspicion, as their harmless properties are, probably, chiefly owing to cultivation, many of the plants in a wild state possessing noxious qualities, and some in such a degree of concentration as to render them poisonous. The seeds of some are oily, and capable of forming an emulsion.

Principal Plants and Uses.

Sub-Order, Nhandirobeæ.

Anisosperma.—The seeds of the species *Passiflora* (Fava de S. Ignacio, Castana do Jabotà) are said to contain a bitter oil, mixed with resin and a bland sebaceous matter, and to be regarded as a valuable stomachic in Brazil. In large doses they are stated to be purgative.

Feuillæa.—The seeds of the species *Cordifolia*, a native of the West Indies, are oily and intensely bitter, and act violently as an emetic and purgative. Those of the species *Trilobata*, yield a fatty oil, reported to be used instead of ointment in pains of the joints. The oil of both species are stated to be employed by the Americans for illuminating purposes.

Hypanthera.—The species *Guapeva*, a Brazilian climber, resembles Anisosperma Passiflora in properties.

Telfaria.—The seeds of the species *Pedata* (Joliffia Africana, De Candolle), a native of Africa, are stated to possess a very agreeable flavour, resembling almonds, and to yield by expression abundance of oil, equal to that of the finest Olives. The pulp is said to be exceedingly bitter, and when only applied to the tongue to be productive of violent headache.

Zanonia.—The species *Indica*, or Bandolier fruit, possesses the odour and taste of the cucumber; the bruised leaves are infused in baths, and, mixed with butter, are stated to serve for the preparation of an antispastic liniment.

Sub-Order Cucurbiteæ.

Bryonia.—An article on the species *Dioica*, will be found in our Botanical Calendar for August;* notwithstanding the poisonous properties of other parts of the plant, the young shoots have been used as a pot-herb, and are stated to resemble asparagus in flavour. The species *Americana* and *Africana*, are reported to possess similar properties. The root of the species *Abyssinica*, is said to be eaten, when cooked, without danger. The root of the species *epigæa* was once supposed to be calumba.

Citrullus.—The species *Colocynthis*, is the Bitter Cucumber, or Bitter Apple, and furnishes one of the most valuable medicinal agents derived from the order. Its properties depend upon a neutral bitter principle termed *Colocynthin.* Two kinds of Colocynth are met with in commerce—*The Turkey or Peeled Colocynth*, which is the medicinal colocynth, and is imported from the Levant, North of Africa, and Spain; and *the Mogadore or unpeeled Colccynth*, which is principally used by chemists for their show bottles. This plant is supposed to be the Wild Vine of the Old Testament, the fruit of which is mentioned in 2 Kings iv. 39, 40, as Wild Gourd.

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* Vol. I. p. 271.

Coccinea.—The fruits of the species Indica (Momordica Monadelpha Roxburg), a plant common in India; when fully ripe are said to be employed by the natives as an ingredient in their curries, and to constitute a favourite repast to many birds.

Cucumis.—The fruits of the species *Hardwickii* and *Pseudo Colocynthis*, are said to be powerfully cathartic. That of the species *Melo*, is the well-known Melon. The species *Sativus*, is the common Cucumber.

Cucurbita.—The species *Citrullus*, is the Water Melon, the fruit of which is so highly esteemed for its cooling and refreshing juice. The flesh of the Red Gourd, the fruit of the species *Maxima*, when boiled, is said to resemble a tender carrot in taste. The species *Ovifera*, is the Vegetable Marrow, the fruit of which is so justly esteemed as a culinary vegetable. The species *Pepo*, is the White Gourd, on the surface of the fruit of which a waxy substance is secreted. According to Ainslie, this fruit is presented at every native marriage feast, being supposed to insure prosperity to the wedded pair. An oil called *Egusé*, by the inhabitants of Yorruba, in Africa, and largely used by them for dietetic purposes, and also as a medicine, is supposed to be the produce of one or more species of this genus. Mr. Wilson, the manager of Price's Patent Candle Company, having examined it, states that it is well adapted for burning, for the lubrication of machinery, and other analagous purposes.

Ecbalium.—An article on the species *Officinarum*, or *Agreste*, will be found in our Botanical Calendar for July.*

Lagenaria.—The species *Vulgaris*, is commonly called the Bottle Gourd, from the integuments of the fruit being used as a receptacle for containing fluid. The use, however, of the fruit of the wild plant is not unattended with serious consequences, it being recorded that some sailors were poisoned by drinking beer that had been standing in a flask made of one of these Gourds; and a somewhat similar case is mentioned by Dr. Royle, where symptoms of cholera were induced by eating the bitter pulp.

Luffa.—The fruit of the species Acutangula (Cucumis Acutangulus Ainslee), is a favourite pot-herb of the natives of India, and is esteemed very wholesome; but the fruits of some species, as *Amara*, *Bindaal*, *Drastica*, and *Purgans*, are violently cathartic. That of the two latter is commonly called American Colocynth. The fruit of the species *Fœtida*, is termed the Sponge Gourd, as it consists of a mass of fibres entangled together, and is used for cleaning guns, &c.

Trichosanthes.—The fruits of the species *Anguina*, the Snake Gourd, and others, are employed in curries, in India; but the species *Palmata*, is considered poisonous.

Sub-Order Siceæ.

Sechium.—The green fruit of the species *Edule*, is commonly eaten in hot countries; it is called Chocho, or Chacha. According to Endlicher, the seeds of some Cucurbitaceous plants, called Giraumont seeds, are said to destroy tape-worm.

Varnish to prevent Rust in Iron and Steel.—M. A. Vogel, in *Répertoire de Pharm.*, suggests that the oxidation of steel and iron instruments is very perfectly prevented by coating them with a varnish, made by dissolving one part of white wax in fifteen parts of benzine, and applying it by means of a brush. The very thin layer of wax forms a perfect covering for bright instruments, and, when needed, is easily removed.—*Amer. Jour. Phar.*

Oleum Morrhuæ Ferratum.—Fifteen parts protosulphate of iron are precipitated by 14 parts carbonate of soda; the precipitate expressed; and after the addition of little water, digested for 2½ hours in a water bath, with 250 parts cod liver oil. The deep brown mixture readily becomes clear in a bottle, and soon thickens on exposure to the air. The oil is said to contain about one per cent. of iron.—*Amer. Jour. Phar.*

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* Vol. I. p. 242.

TOUCHING THE AQUARIUM.

II.—Its Construction and Management.

In this chapter I intend to touch upon the construction and management of the ordinary Fresh-water Aquarium, stocked with newts, fishes, mollusks, insects, and plants. The consideration of special points relating to the preservation of leeches in aquaria, must be reserved for a future occasion.

If you wish to establish a miniature fish-pond in your drawing-room, the first thing required is a suitable tank. The making of tanks has become a regular trade, and you have nothing to do but to a pay a visit to one of the dealers in aquaria, and to make such a choice as accords with your taste and your means. A very capital aquarium can be formed with a propagating glass, such as is used by gardeners. These glasses can now be obtained fitted with proper stands, and manufactured from a clearer kind of glass than formerly. The happy idea of inverting a propagating glass gave an immense spur to aquarium studies by reducing the first outlay to a few shillings.

Glass tanks of a rectangular form are, however, preferable to the round aquaria for many reasons: they do not distort the objects seen through their sides, they afford greater facilities for microscopic research, and they are less liable to breakage. The glass vase is extremely fragile, and an unlucky blow ruins it at once, and perhaps destroys the labour of many weeks; whereas a cracked side in a regular tank can be easily replaced.

Whether tank or vase, the aquarium should be provided with some sort of cover to keep out the dust, and to prevent the more adventurous creatures, such as beetles and newts, making their escape. A sheet of glass of the required size is by far the best material for this purpose, as its transparency permits us to see the surface of the water. The cover must not be absolutely air-tight, but there is no necessity for any special contrivance for admitting the air. If the cover be allowed to rest lightly upon the edges of the aquarium an ample supply of the life-supporting gas will find its way to the imprisoned animals.

Before filling your aquarium with water it is necessary to lay down a suitable stratum of soil in which your plants can take root. The material of which this soil is composed is not of so much importance as at first might be imagined. Most aquatic plants derive their sole nourishment from the water in which they flourish, and merely make use of their roots as anchors to insure their stability. A great many, indeed, have no roots at all, and float about in their native ponds, changing their place at the caprice of every breeze and ripple. In an aquarium it is best to study neatness and cleanliness in your choice of materials for forming a bottom.

Before the necessities of the plants were properly understood, aquaria were generally bottomed with a thick layer of pond mud, which, being constantly stirred up by the fishes, so dirtied the water that it was sometimes difficult to catch a glimpse of the more minute objects. Experience has since shown that a layer of well-washed river sand mixed with pebbles will answer all the requirements of the common kind of plants, and will never interfere with the crystal transparency of the water. Even river sand has its objections, as it sometimes turns black, and becomes unsightly: very small pebbles or shingle may occasionally be substituted for it with advantage. The depth of the stratum of sand or pebbles must be regulated according to the size of the tank, but it need seldom exceed three inches. Many people have a notion that an aquarium should be loaded with rockwork, and think that fantastic arches, and minarets of Roman cement, add to the beauty of the tank. If the vessel be very large, then a few irregular blocks of stone may be introduced with a good effect, but in a small tank I should recommend the exclusion of rockwork altogether, as it takes up a great deal of room that cannot be well spared, and unless it be very tastefully managed has a childish and ridiculous appearance. I need scarcely caution the reader against admitting sea shells, branches of coral, plaster images, and other mantel ornaments into a fresh-water aquarium, though I have seen such a violation of taste perpetrated again and again. An aquarium should be made to imitate nature as closely as possible, and as we neither find cowries, corals, nor busts of Napoleon in our brooks and ponds, we have no right to introduce such objects in our tanks. Gilbert White had occasion to animadvert upon a very similar barbarity practised by certain keepers of gold fish in his day. "Some people," he says, "exhibit this sort of fish in a very fanciful way, for they cause a glass bowl to be blown with a large hollow space within, that does not communicate with it. In this cavity they put a bird occasionally, so that you may see a goldfinch or a linnet hopping, as it were, in the midst of the water, and the fishes swimming in a circle round it. The simple exhibition of fishes is agreeable and pleasant, but in so complicated a way becomes whimsical and unnatural, and liable to the objection due to him,—

> 'Qui variare cupit rem prodigialitèr unam.'"

Having deposited a proper layer of sand, the water plants may be introduced. You can purchase these plants from any of the dealers in gold fish and aquaria, or you can procure them for yourself from any neighbouring ponds. The Valisneria and Anacharis are two of the best weeds for aquarian purposes. The *Valisneria spiralis* (for that is its botanical name) is a fine grassy-looking plant having perennial roots, which do not require any great depth of soil. Its long green leaves rapidly decompose the carbonic acid of the water, and consequently make it a capital purifier. This plant is said to give to the canvas-backed duck of America its peculiar richness of flavour. The *Anacharis alsinastrum*, or new water weed, was lately introduced to this country from Canada among timber, and has multiplied, self-sown, to such a prodigious extent, that it threatens to choke our canals and rivers. It is a pretty moss-like plant, and will thrive without any roots at all, and soon fill an aquarium with its delicate green fibres. Any common water weed may be naturalised in the aquarium, and, as our ditches and ponds contain hundreds of different species, the reader need not be at a loss for plants. When such plants have been fixed in the sand as require a root-hold, the tank should be filled with water. Even this requires a little forethought. It will never do to pour the water from a jug, as sand has not stability enough to withstand the stream, and you run the risk of spoiling your ingenious arrangement of the plants. The safest way of adding water is by means of a garden-pot with the rose on, or by holding a plate in the left hand as low down in the tank as possible, in order that it may receive the dash of water from the vessel in the right. Another plan is to pour the water into a jug standing on the bottom of the tank, and allow it to run over the sides until the tank is full.

Ordinary river water, or even spring water, will do for filling the aquarium. It is better to wait two or three days before you venture to introduce the animals to their new home, in order that the plants may properly aërate the water.

Of the animals suited for an aquarium fishes take the first rank, as they form by far the most interesting feature of the fresh water tank.

The *Cyprinidæ*, or carps, are all easily domesticated. They are inhabitants of fresh water, and are exceedingly numerous over most parts of the world. They feed upon aquatic plants and insects, the plants constituting their principal diet during summer, when, as dear old Izaac Walton tells us, their flesh is very indifferent. The common carp does not appear to be a native of this country, but was introduced from the south of Europe at a very early date, and has long since become a naturalised subject of this realm.

The well-known and favourite gold fish is an eastern relative of the carp family, its generic name being *Cyprinus auratus*. The silver fish is merely a variety of the same species. The young fry, when first produced, are perfectly black, but they afterwards change to white, then to gold colour; the latter colours appear first about the tail, and extend upwards. They are said to have been introduced into England in 1691. The perch (*Perca fluviatilis*) is a glorious fish, but requires more room than can be afforded it in a small aquarium; it may, however, be kept while in its infancy. The minnow (*Leuciscus phoxinus*) ought always to find a place in the aquarium: it has a very little body and a very happy disposition. I have watched a shoal of minnows in a tank for hours, and have been wonderfully interested by their rapid movements; they are never still an instant, but dart here and there, apparently for no other purpose than to gratify their love of sport. Besides these fishes the barbel, the gudgeon, the roach, the chub, and the dace, all well-known members of the finny tribe, and all suitable for aquarian purposes.

The interesting class of Batrachia deserves to be represented in the aquarium, though a strong and unmeaning prejudice exists against the strange little creatures that belong to this division of animated nature. The water newts, or efts, have nothing repulsive about them, and are much more intelligent creatures than fishes. There are two kinds of newts in Great Britain; the common smooth newt (*Lissotriton punctatus*), and the great water newt (*Triton* *cristatus*). During the breeding season the males of both species have large serrated frills down their backs, and make a very splendid appearance. They share with their brother Batrachians, the toads, the reputation of being venomous, but are, however, perfectly harmless, and may be handled with impunity. In its mature form the newt is exclusively an air-breathing animal, and its presence in an aquarium does not diminish the fishes' supply of oxygen. Its action in rising to the surface for an occasional whiff of fresh air is well worthy of observation. It feeds upon aquatic insects and other small animals, particularly tadpoles. Small water tortoises and salamanders have recently been imported for aquaria.

I am rather doubtful as to whether insects ought to be admitted into aquaria which are intended merely for parlour ornaments; but the naturalist, who wishes to study the various forms of aquatic life, will not consider his tank perfect unless the important class of insects be properly represented. Considerable care must be bestowed on the selection, as some members of the beetle tribe are so bloodthirsty that they will even venture to attack the smaller fish, and thus introduce discord into your happy family. The *Dyticus marginalis*, for instance, is a perfect fiend, and will devour tadpoles by dozens. In its lava state it is equally destructive, and is known as the "water-devil." The great aquatic beetle (*Hydrophilus piceus*), in spite of its enormous size, is comparatively harmless; it may be safely admitted into the society of fishes and Batrachians, and its movements will give variety to the aquarium. There are other beetles of a smaller size, known as *Colymbetes*, which may be added to the collection without danger. The water boatman (*Notonecta*) is a very interesting insect, though it is somewhat given to preying upon smaller creatures. It lies on its back all day, and rows about its boat-shaped body with a long pair of oars; but as soon as night comes on it turns head over heels, and, opening a pair of handsome wings, starts on an aërial excursion in pursuit of flies. If the boatman be allowed to paddle about in an open aquarium it will be found necessary to guard against its escape by covering up the tank at nightfall. Caddice worms may be introduced into the tank with safety, and their clumsy attempts at locomotion will afford the observer considerable amusement. These worms are the larvæ of various species of *Phryganea.* To protect their soft bodies, which constitute a favourite food with fishes, they always inclose themselves in cases formed of various materials—bits of straw and sticks, pebbles, and even small shells being commonly employed in this manner.

Mr. Warington was greatly troubled, during the first experiments, with the rapid growth of confervæ upon the sides of his tank. Here was an imperfection that at first sight appeared irremediable. Nature, however, provides for all emergencies, and the acute experimentalist was not long in discovering how this growth might be kept within proper bounds. He sought the assistance of nature's scavengers, and introduced a few water snails into his tank. The end was attained, and he saw with delight that these despised creatures went about their work in a most business-like manner, and very quickly removed the objectionable green film which had formed upon the glass. The best shells for an aquarium are now found to be the curious coil shell (*Planorbis marginatus*), which may be known by its flattened shape; the beautiful marsh shell (*Paludina vivipara*), and the small mud shell (*Limneus pereger*). The large lake snail (*Limneus stagnalis*) should be avoided, as its appetite is proportionate to its size, and it will not hesitate to devour your choicest plants. In stocking an aquarium, it must be borne in mind that overcrowding must sooner or later lead to fatal results. It is much better to possess four or five little animals in perfect health than a couple of dozen consumptive creatures, who have neither room enough to disport themselves naturally, nor air enough to supply their wants. A small gold fish and a couple of water plants have been recommended for every gallon of water, and perhaps it would be advisable not to greatly exceed these proportions. A little hand-net will be required for removing animals from the tank, for clearing away dead leaves, and similar operations. A gutta-percha or glass siphon should also be provided, in order to drain off the water should it become foul, though, if the aquarium be properly managed, the water will retain its purity for an indefinite length of time.

Some writers on the aquarium recommend artificial aëration, but when the balance of vegetable and animal life is properly adjusted there is no necessity for resorting to any extraordinary means to insure a copious supply of oxygen. As it is extremely probable, however, that some of my readers will yield to the temptation of over-stocking, I think it advisable to inform them that, by forcing a stream of air through the water contained in their tanks, they may maintain its purity in spite of the preponderance of animal life. A pair of bellows, to which an India-rubber tube is attached, will be required for this purpose. Still more handy is an India-rubber bottle with an ivory nozzle. Artificial aëration may also be effected in another way, namely, by removing a portion of the water from the aquarium every morning, and allowing it to drip back from some little height into the vessel. The water is thus exposed to the action of the air drop by drop, and returns to the tank in a highly oxygenated state. B.

PHOTOGRAPHIC CHEMICALS.—VIII.

Iron, Protonitrate of. $Fe\,O, N\,O_5 + 7\,H\,O$; atomic weight, 153·.—This salt is used by many as a positive developer, and gives a brilliant white image resembling in character that formed in the daguerreotype process. It is used in conjunction with sulphate of iron. The following formula may be used for its preparation:—

Protosulphate of iron	1½ ounce.
Nitrate of baryta	1 ounce.
Alcohol	1 ounce.
Nitric acid	40 ounces.
Water	16 ounces.

Powder the nitrate of baryta very finely, and dissolve it in the water by heat. Reduce the protosulphate of iron also to powder, and stir it into the hot solution, continuing the stirring for four or five minutes to insure decomposition. Filter carefully, and when perfectly cold and clear add the nitric acid diluted with an ounce of water, and, lastly, the alcohol. This developer will keep for two months in a cold place if the bottles are filled to the neck. If it becomes slightly decomposed, add to it a little plain protosulphate.

Iron, Protosulphate of. $Fe\,O, S\,O_3 + 7\,H\,O$; atomic weight, 139·.—This salt, called in commerce green vitriol, is obtained by acting on pure iron filings with dilute sulphuric acid, evaporating and crystallizing. It should be free from red persulphate, and when pure is of a *bluish* green colour, whereas that contaminated with the persalt is yellowish green. Its purity may be readily tested by adding a few drops of solution of ferrocyanide of potassium to its aqueous solution. The precipitate should be nearly white, and the quantity of blue formed will give an idea of the amount of persulphate contained in it. This is one of the most important photographic materials, and its purity is of the greatest possible consequence. It enters into every positive developer; and from the delicacy of half tone given by its use, it has been used by many as a negative developer, the weak image formed by it being afterwards strengthened by pyrogallic acid. By many it is thought to require less exposure in the camera. It is perfectly true that with a bromized collodion, or an acid bath, a less exposure may be given when an iron developer is substituted; but when both the bath and the collodion are in proper working order, and the temperature is above 40°, no perceptible difference exists between similarly exposed negatives developed with the different solutions.

Protosulphate of iron should be kept in a very dry place; and being extremely cheap, a large quantity should not be kept in stock, as it is liable to spontaneous decomposition. The solutions when once decomposed should be thrown away. When in use they must be frequently filtered, as oxide of iron is continually forming on them, which, if thrown on the delicate surface of the positive, is sure to discolour the image.

Kaolin, or China Clay.—This substance, prepared by levigating mouldering granite and felspathic rocks, is nearly pure silicate of alumina in a fine state of division. It is perfectly insoluble in water and acids, and is employed by photographers to decolorise solutions of nitrate of silver which have become brown from organic matter. It is used by shaking up a quantity with the discoloured nitrate of silver in a bottle for several minutes and filtering. The kaolin absorbs the organic matter from the nitrate of silver, and the filtered liquid is perfectly pure and bright. The filtration must be performed three or four times. The same kaolin may be used for several batches of silver solution. Commercial kaolin contains a small quantity of chalk, which must be removed by washing it with a little dilute acetic acid. The acid of course must be well washed away with water. The best method of doing this is by decantation, filtration being somewhat troublesome from the pores of the paper becoming speedily clogged.

Lead, Nitrate of. $Pb\ O, N\ O_5$; atomic weight, 165·6.—Nitrate of lead is preferred by many for making protonitrate of iron instead of nitrate of baryta. The atomic weight being greater, a proportional increase in the quantity used must be made.

Magnesium, Iodide of.—This iodide and the corresponding bromide have been recommended for iodising solutions by Mr. Mayall from their easy solubility in alcohol. It is somewhat difficult to obtain iodide of magnesium sufficiently pure for this purpose.

Mercury, Chloride of. $Hg\ Cl$; atomic weight, 135·5.—This substance, commonly known as corrosive sublimate and bichloride of mercury, is made by subliming equivalent mixtures of sulphate of mercury and chloride of sodium. It is very poisonous, and being somewhat like white sugar, purchasers should be warned to keep it under lock and key. It is soluble in sixteen parts of cold and three parts of hot water. By the addition of chloride of ammonium or hydrochloric acid, its solubility may be greatly increased. It is used in the alabastrine process, as it is termed, to whiten the positive image. The image is first developed in the usual way with protosulphate of iron; it is then washed, and the "alabastrine" solution poured over it. The image immediately begins to whiten, and gradually gets lighter until the whole assumes a bright white tint. The explanation of this change appears to be, that the chlorine of the mercurial salt is partly absorbed by the metallic silver leaving a mixture of subchloride of mercury (calomel), and chloride of silver. Positives bleached by this process are extremely liable to become discoloured from the sulphur in the air. Great care must, therefore, be taken in mounting them to prevent the possibility of the air reaching their surface.

Nitric Acid. $N\ O_5$; atomic weight, 54·.—The properties of this corrosive substance are so well known that it would only be waste of time to repeat them here. Its use in the manufacture of pyroxyline has received sufficient notice under the head of Collodion. It is often used in a diluted state, one of acid to twenty of water, to clean glass plates. The diluted acid should be always well washed from them, otherwise it will be introduced into the bath.

Potash. $K\ O + H\ O$; atomic weight, 56. Solution of caustic potash is frequently used in a more or less diluted state for cleaning glass plates. The ordinary liquor potassæ of the P.L., forms an excellent lye for cleaning plates which have been varnished. If left in it for a day or two the film floats off easily. Care should be taken to wash such plates in a large quantity of water, as the smallest particle of the potash remaining in the cracks at the edges would render the bath alkaline.

Potash, Bichromate of. $K\ O, 2\ Cr.\ O_3$; atomic weight, 147·5.—There are two chromates of potash, the yellow neutral chromate, and the red acid bichromate. The latter is chosen for use in photography from containing the larger portion of chromic acid. When mixed with an organic principle, such as gum, gelatine, or albumen, and exposed to light, chromic acid gives up part of its oxygen, and forms an insoluble compound of oxide of chromium in combination with the organic matter. This property has been taken advantage of in the various processes for carbon printing and photographic engraving. It is easily obtained in a pure state. Its photographic properties were discovered by Mr. Mungo Ponton, some years before the publication of the talbotype and daguerreotype.

Potash, Nitrate of. $K\ O, N\ O_5$; atomic weight, 101.—Is used by some in place of nitric acid in the preparation of pyroxyline. For this purpose it should be pretty free from chloride of potassium, a salt with which it is frequently contaminated. Its presence may be detected by testing with nitrate of silver, a white precipitate falling down if the chloride is present. This salt is also used in making positive developers.

Potassium, Bromide of.—This salt is used in the Calotype and waxed paper processes. It should not be employed as a bromiser for collodion, as it is apt to cause spots and stains. Bromide of ammonium should be substituted when a soluble bromide is required.

Potassium, Cyanide of. $K\ C_2\ N$ or $K\ Cy$; atomic weight, 65.—Cyanide of potassium is formed by a union of the metal potassium with the compound gas cyanogen. As met with in commerce, it contains from 50 to 5 per cent. of carbonate of potash, being manufactured by calcining certain proportions of salt of tartar and ferrocyanide of potassium (yellow prussiate of potash). Being a powerful solvent of the insoluble silver salts, it is greatly used to remove the unaltered iodide of silver in the glass processes. It is very soluble in water, but on keeping its solution decomposes, forming prussic acid and other compounds. Being a most deadly poison it should be used and sold with great care. It is very like lump sugar at a little distance, and hardly a month passes but some photographer's child meets with its death by means of it. In using it, care should be taken not to let it enter any wound or scratch, inflammation of a serious character being likely to result from such accidents. Its best antidote is protosulphate of iron. It is used also for removing stains from the hands and linen. The solution should not be too strong. Its use is inadmissible in the paper processes, from the facility with which it dissolves the image. The deposit in the glass processes containing less organic matter is not so easily dissolved. The solution used should be sufficiently weak to clear the picture in not less than a minute, otherwise the finer portions of the image will be attacked.

REVIEWS

The Technologist. Edited by Peter Lund Simmonds. Vol. I. Kent and Co, Paternoster Row. 7*s.* 6*d.*; in Monthly Parts, 6*d.*

As we predicted, some months since, this excellent periodical has now taken a firm position amongst the standard technical serials of the day. The first volume, which is now before us, contains nearly one hundred articles, or rather essays, on different substances and processes from practical writers in every department of technological science, beginning with Professor Faraday, and ending with M. du Chaillu.

We are glad to perceive from its pages that merchants are beginning to take an interest in the produce they buy and sell. The wood broker studies botany, the shell merchant is half a conchologist, and the perfumer discourses learnedly on the chemical principles of his art. This is as it should be; and it is a principle we have always endeavoured to inculcate both by word and deed in our own pages. The mere buyer and seller of the old school has now no chance against the intelligent merchant who brings his scientific knowledge to bear upon the transactions of the sale room and the market. Such works as the *Technologist* will soon become as necessary to the counting-house as the London Directory or the Shipping List. The pharmacist may learn much from this volume, more especially from the very able articles on "Quicksilver," "The Sponge Fisheries," "The Sources of Musk," "Insect Medicines," "Manna," "Dugong Oil," "Opium," "Antimony," "Galls," and a host of others on these and cognate subjects.

Where requisite, the subject matter is illustrated by woodcuts and plates, and the general getting up of the work is excellent both as to paper and type. To be somewhat hypercritical, there is only one fault we can find with the present volume, and it is one that can be readily amended. It is the absence of a page for "Notes and Queries." Experience has long taught us the value of this in our own journal; and the benefit that Technology would derive from the establishment of such a department in its only literary organ would be incalculable.

We may mention, in conclusion, that Mr. P. L. Simmonds, the Editor, has been appointed to the control of the Colonial Department of the International Exhibition, in conjunction with Dr. Lindley, the eminent botanist. We may congratulate Her Majesty's Commissioners on their selection of two such able men for this purpose.

PUBLICATIONS RECEIVED.

Book.—An Introduction to Practical Chemistry, including Analysis, by John E. Bowman, F.C.S. (Churchhill). [A critical notice of this excellent hand-book will appear in our next, having pressed out of the present issue by articles upon trade questions.]

Periodicals.—Pharmaceutical Journal. — Technologist. — Geologist. — Dublin Hospital Gazette.—Practical Mechanics' Journal.—Civil Engineer.—Journal of the Society of Arts.

Our parcel of American Journals for September has come to hand.

UNITED SOCIETY OF CHEMISTS AND DRUGGISTS.

GREAT MEETING AT MANCHESTER.

A large meeting of the chemists and druggists of Manchester, and delegates from the surrounding district, was held at the Town Hall, on Wednesday, the 2nd instant, under the presidency of Mr. Alderman Bowker. The Society, as announced by the prospectus, is "based upon the principle of co-operation, as essential to the strength and progress of chemists and druggists as a trading community."

The **Chairman** said he considered it an honour to preside over such a respectable and numerous assembly. Their presence was a proof that they intended to take their interests into their own hands, and to protect and keep them as they ought. In Manchester they had been a very much divided and neglected body, not having co-operated amongst themselves as other people had done. The pawnbrokers had for years adopted the early closing movement, and had also one afternoon's cessation from business in the week. He did not know that there was a business in the country in which there was more drudgery and hard labour than that of the chemists and druggists. The public would not even allow them to have the Sabbath day. He believed that by co-operation, and rightly understanding their interests, they could confer a very great benefit upon themselves. He did not mean to say they could attempt to make an uniform rate of prices; on the contrary, he thought free trade and open competition was the soul of business. He believed the Grocers' Association had brought about most satisfactory results. He hoped whatever resolutions they adopted would be honestly and fairly carried out.

Mr. **Buott**, of London (in the absence of the secretary), said that the Society took its rise in a number of letters which had appeared almost simultaneously in the *Chemist and Druggist*, having been contributed by various gentlemen in the trade, and which contained a number of appeals and suggestions. Mr. C. F. Buott, of London, was ultimately appointed secretary. A 5*s*. per annum membership was adopted as the basis of the Society, and a benevolent fund as its primary object. A large number of gentlemen were consulted, and their opinion was decidedly in favour of some such Society being formed. A meeting of the trade was held at the London Coffee-house, Ludgate-hill, at which an unanimous resolution was adopted, that the Society should be recognised; and 1,200 or 1,300 had been entered upon the roll during the eight months which had passed since it was commenced. He thought the gentlemen now present would consider that was a sufficient indication of the determination of the trade to support the principles of the Institution. It was intended that the Society should not be a local, but a national one, extending in its ramifications even to the small towns. It was proposed to divide the country into districts, and Manchester had the honour of being the first so organised. He trusted the means adopted would be sufficient to accomplish all the objects of the Society, and to enable members of the trade in different localities to unite, and to consult with each other as to their local interests.

Mr. **Clement Taylor** moved:—"That co-operation is essential to the strength and progress of chemists and druggists as a trading community."

Mr. **Pawsey** (Miles Platting), seconded the resolution, which was unanimously adopted.

Mr. **Alderman Goadsby** moved:—"That the members of the United Society of Chemists and Druggists, resident in Manchester and adjacent towns, do now form themselves into a district association, to carry the following objects of that institution into effect:—1. The establishment of a benevolent fund for the assistance of members in sickness, old age, and death. 2. To carry out, by district meetings and combined action, any improvement that may be deemed necessary for the welfare of the trade, such as early and Sunday closing, or any other arrangement that may be of advantage. 3. To watch the progress of, and support or oppose any legislative enactment that may affect the interests of the chemists and druggists as a trading community. 4. To answer any legal question relating to the trade rights of members free of cost. 5. To keep a registry of the transfer of businesses required, partnerships, and situations for assistants, &c., and to be the general recipient and exponent of any other trade requirement. 6. To establish a library of reference and a reading room, furnished with trade periodicals and works of scientific interest. It is intended, also, as the Society progresses, to establish a school for the children of members, and to facilitate analytical inquiry." Probably the reason he had been selected to bring the resolution before them was that he was about the oldest member of the trade in Manchester, having entered it forty-four years ago. It appeared to him that the time was coming when they might act as a body beneficially for all. A movement was commenced in 1826, the objects of which were somewhat similiar to that of the present Society. At that time they opened their places of business every morning at seven, and never closed them until eleven. An agitation was commenced by the assistants, in which he took a part, but the employers (who, at that time, in Manchester, and within a radius of two miles, only numbered nineteen) instead of considering their requirements, turned their attention elsewhere, and made some most curious regulations as to the prices of articles, including the prohibition of the sale of more than six assafœtida pills for 6*d*. The hour for closing was also fixed for nine, but this rule was gradually disregarded. From that time they had ignored all connection with each other. He was bound to say he believed the business was conducted, as a rule, with as much of honour as any with which he was connected. Mr. Alderman Dakin, of London, the president of the United Society, was a man of very great energy and ability, and, so far as London was concerned, would ably support the objects of the Society. He thought, from experience, that any man starting fairly in business, and practised wisely, could make something more than the requirements of the day; but some were cut off early in life, and probably left a wife and young children destitute or little provided for, and the man would be wanting in common sympathy who would not in such case aid in giving assistance. From first to last he thought they should give the benevolent fund their primary consideration. If they so increased in numbers, and their funds became adequate, by all means let them attempt the remainder of the stated objects.

Mr. **Slugg**, in seconding the resolution, remarked how greatly such a Society had been needed. He advocated the coalition of the Society with the Pharmaceutical Society, and the carrying out jointly of the principles of the United Society. He alluded to Sale of Poisons Bill, introduced in the last session but one of Parliament, and the question of the definition of "What is a patent medicine," as instances of the numerous cases in which the body of chemists and druggists ought to have something to say. From that numerous meeting they must augur well for the success of the undertaking.

Mr. **Blain** (Bolton), moved, and Mr. **Hall** (Bolton), seconded, a resolution, stating the various offices in connection with the Association for each town or division. Mr. **Pennington**, of Bury, supported the resolution.

Mr. **Guilmette** moved the next resolution, which stated the duties of the local secretaries. Mr. **Buott** supported the resolution. In answer to objections which had been raised with respect to the 5*s.* per annum membership, he said the promoters knew there were about 30,000 chemists and druggists in the United Kingdom, and perhaps 20,000 assistants, and they reasonably calculated that in the course of time one-fifth of these would become members, and then a sufficient amount would be raised even with so small a subscription. They were solicitous that the benevolent fund should be really beneficial, and therefore decided that the subscription should be so low as to embrace that class which was most likely to furnish candidates for relief. They also hoped that gentlemen who had the means would furnish greater contributions. He asked the gentlemen present whether they were willing to roll away the reproach which attached to them up to the present time as a body of tradesmen? Would they have the privilege of closing their shops at a reasonable hour like other men? Would they rest from the labour on the Sabbath as other Christians did? Would they have a real bonâ fide benevolent institution? If they would have these advantages, they must co-operate, and be determined to make some sacrifice. He believed that at the end of a few months Manchester would be the centre of a district embracing a least 300 members. If exertions were made adequate to the occasion, there was no doubt that in a short time that institution would be ranked amongst those institutions of the country which stamped it with honour and credit; and in a few short years they would have erected an asylum and school which would perpetuate the fact that chemists and druggists had a charitable consideration for their poor brethren.

The **Chairman** moved—"That Mr. Alderman Goadsby be respectfully requested to accept the chairmanship of the district." He knew that Mr. Goadsby's business and public engagements were most extensive, but no man in the district would be a greater moral support to the institution, and he hoped he would accept the office.

The resolution was seconded by Mr. **Wilde** (Upper Brook-street), and passed unanimously.

Mr. **Alderman Goadsby** accepted the office, and thanked the chairman for the terms in which he had proposed the resolution. He remarked that by agglomeration of numbers they were certain of securing a position for the trade of the district, which they had never hitherto been able to command, and they could not otherwise form a conception of.

On the motion of Mr. **Hebb**, seconded by Mr. **Maunder**, a district committee was appointed, Mr. Alderman Bowker being the chairman, and Mr. C. Taylor the secretary.—With votes of thanks to the Mayor for the use of the room, and to the Chairman, the meeting terminated.

PROSPECTS OF THE INTERNATIONAL EXHIBITION.*

It is not easy to overrate the importance of the Exhibition as a record of industrial progress and a means afforded to manufacturers of comparing notes. In this form it has often been presented to intending exhibitors; but it possesses another, and perhaps more real attraction, which its friends seldom allude to. This is its power of advertising. No scheme ever devised could offer such advantages in this respect to exhibitors; to the Foreign and Colonial even more than the Home producer. Those who neglected to avail themselves of it in 1851, may still hold back in 1862; but surely not after they examine the history of such industrial displays, and the prospects of this particular Exhibition. To the Foreign and Colonial exhibitors it offers a field for making known their trading merits in a language understood by all countries—the language of samples. The new regulations of Her Majesty's Commissioners with regard to the fixing of prices on articles, make it more of a business Exhibition than the last great display, and the advance of population, capital, and railway facilities during the last eleven years, when it is fairly stated, can hardly fail to stir up even the most laggard of our Foreign competitors.

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* From a Circular issued by the International Exhibition Agency, referred to in another portion of our Journal.

Passing in review the history of Industrial Exhibitions in this country, the first that comes under notice is one held in 1829, under the patronage of King George the Fourth, called "A National Repository for the Exhibition of Specimens of New and Improved Productions of the Artizans and Manufacturers of the United Kingdom," and which took place in the Royal Mews, Charing Cross. This, though under the management of a committee of distinguished men, with the Hon. G. Agar Ellis for its chairman, was not sufficiently successful to warrant its being repeated. The idea of forming in England periodical exhibitions of the products of industry in connexion with the Society for the Encouragement of Arts and Manufactures, was conceived in 1845, when a committee of the council of the Society of Arts was appointed to make the necessary enquiries as to the willingness of manufacturers to contribute their productions to such an exhibition, and a fund was subscribed for the purpose of meeting the preliminary expenses. Owing, however, to the want of sympathy on the part of the manufacturers the project was not then proceeded with.

The English people were then very imperfectly acquainted with the value of such exhibitions, and their influence upon the character as well as the commerce of the nation. They required to be educated for this object, and education had to be provided. Premiums for Works of Industrial Art and Exhibitions, on a comparatively small scale, were accordingly instituted by the Society of Arts for this purpose; and thus arose the Society's series of special premiums for specimens of British Arts and Manufactures, which, with the annual exhibitions of them, have formed so important an element in the progress of public knowledge, and the formation of public taste.

So little advanced, however, was public information, that in 1846 hardly any competitors came forward, and it was with difficulty the judges could find subjects worthy of reward.

The first exhibition of any magnitude—stimulated by His Royal Highness Prince Albert, the president of the Society of Arts—took place in the house of the Society, in March, 1847. It would have been a total failure but for two individuals, who made it a point of personal favour, with a few great manufacturers, to be permitted to select from their stores a sufficient number of articles to make a show. The result was highly satisfactory. Twenty thousand people visited the exhibition; and next year, in 1848, the exhibition on the part of the manufacturers was spontaneous, and upwards of seventy thousand persons visited the Society's rooms. The next exhibition, in 1849, was still more successful; the visitors were more numerous, the articles sent in were of a superior quality and design, and the public taste was better educated to appreciate their excellence.

It was obvious during the progress of the foregoing Exhibitions, that the public mind was gradually becoming better informed on the nature and effects of great public exhibitions of Industry; and at the end of the session, in June, 1849, everything seemed ripe for carrying into effect the plan of a Great Exhibition. Subsequently his Royal Highness suggested the four great divisions of *Raw Material—Machinery and Mechanical Inventions—Manufactures —Sculpture and Plastic Art*, of which he proposed the Exhibition should consist. This was ultimately adopted, and contributions from foreign producers were invited, thus giving to the Exhibition its distinguishing character of universality as a collection of the Industry of All Nations.

At this period so little was known of the general feeling of manufacturers and agriculturists towards such displays in this country, that less than two years before the opening of the Great Exhibition, a commission was appointed to visit the principal towns in England, Ireland, and Scotland, and collect opinions from the leading men. The result was most satisfactory. On the point of the general expediency of such periodical exhibitions, they met with the most perfect unanimity in all parts of the country, and expressions of surprise, if not regret, that England should have been so tardy in instituting such an exhibition.

It was considered that the benefits of the exhibition would be great—individually and nationally; that great good had been done on the continent by such exhibitions; and that the larger the competition the better would it be for all.

On the important point of whether such exhibitions should be supported by a national grant, or by voluntary subscriptions, the preponderance of opinions was *wholly* in favour of the voluntary principle, and it was generally considered that if the financial aid of government had been sought, the public would have felt themselves relieved, in a great measure, from the necessity of assisting.

Fifty towns were visited after this, and meetings were held, at all of which favourable resolutions were passed; and by January, 1850, the names of 60,000 influential persons had been obtained as supporters of the great plan.

About this date, on the application of the Society of Arts, the Royal Commission was appointed; the burden of the Guarantee Fund was thrown upon the voluntary contributors; and in May, 1851, the building was successfully opened, under the energetic exertions and able organisation of the Executive Committee.

The first Great Exhibition remained open about five months and a-half. Its foreign exhibitors numbered six thousand five hundred and fifty-six, and the exhibitors of the United Kingdom and dependencies, seven-thousand three hundred and eighty-one, forming a grand total of thirteen thousand nine hundred and thirty-seven. The estimated value of the articles exhibited (excluding the famous Koh-i-noor diamond) was:—

	£.	s.	d.
United Kingdom	1,031,607	4	9
Dependencies of ditto	79,901	15	0
Foreign countries	670,420	11	7
Total	£1,781,929	11	4

The number of prize medals awarded was two thousand nine hundred and eighteen, and of Council medals, one hundred and seventy. The daily admissions by payment reached 5,265,429, and the season-tickets, 773,766;—together, 6,039,195; the gross receipts were respectively 356,278*l.* and 67,514*l.*;—together, 423,792*l.*; and the nett profit was about 200,000*l.* at present invested by Her Majesty's Commissioners in rapidly-improving land at South Kensington.

Large as these results may appear, they show a comparatively small success if we look at the number of visits compared with the amount of local population. The population of the metropolis in 1851 was 2,300,000, and this gives little more than two and a-half visits to each individual. The twelfth Exhibition at Paris, in 1855, shows an increase upon this, as, with a population of 1,200,000, the receipts reached 128,099*l.*, and the visitors 4,593,576, which gives three and three-quarters visits to each individual. The exhibitors, although showing a decrease upon those of 1851, in London, showed a marked increase upon those of the eleventh French Exposition of 1849. Their numbers were 9,790, without Algeria, as against 4,494; an increase greatly attributable to the admission, after our plan, of international exhibitors.

Leaving the facts of the past for the calculations of the future, we come upon the increase of London population in 1861. Taking the figures of our last census, without assuming any increase, we get, in round numbers, 2,800,000, as against 2,300,000 in 1851. This number is almost equally divided into males and females.

Next follows the change that will have taken place in the population during the space of eleven years. Taking the males at 1,400,000, one quarter of this number will consist, in 1862, of persons who were too young to benefit by the Exhibition of 1851, and one half will consist of persons between the ages of 15 and 50, capable of appreciating the new Exhibition. With regard to the female half of the population, their attendance as visitors may be calculated to outnumber those of the males.

The number of visitors, however, will not altogether depend upon the population, but upon the facilities offered for conveying that population to the Exhibition.

The following table, compiled roughly from certain Board of Trade returns, will show that there has been a steady increase in railway traffic in England from 1849 to the present time:—

	Separate Journeys, in round Nos.	Increase.	Miles Open.	Increase	Journeys per Mile.	Increase.
1849	64,000,000		5,579		11,442	
1850	73,000,000	9,000,000	6,326	747	11,515	73
1851	**85,000,000**	**12,000,000**	**6,755**	**429**	**12,640**	**1,125**
1852	89,000,000	4,000,000	7,113	358	12,531	Decrease 109
1853	102,000,000	13,000,000	7,448	375	13,659	1,128
1854	111,000,000	9,000,000	7,846	358	14,160	501
1855	119,000,000	8,000,000	8,177	331	14,503	343
1856	129,000,000	10,000,000	8,502	325	15,213	710
1857	139,000,000	10,000,000	8,901	399	15,617	404
1858	148,500,000	9,500,000	9,251	350	16,017	400
1859	158,000,000	9,500,000	9,601	350	16,417	400
1860	167,500,000	9,500,000	9,951	350	16,817	400
1861	177,000,000	9,500,000	10,300	350	17,217	400
		ASSUMED				
1862	**177,000 000**	**9,500,000**	**10,300**	**350**	**17,217**	**400**

Had the increase of nine and a-half millions of railway journeys a-year been uniform, the number of journeys per mile in 1851 would have been only 12,132, giving an increase of 468. If this be multiplied by 6,755, the number of miles open that year, it will give us

3,161,340 journeys as the increase of travelling due to the Exhibition. Some of the additional journeys may have been due to other causes, but a large proportion of the travellers, on the other hand, must have paid more than one visit to the Exhibition, and there is, therefore, fair reason to assume that one and a-half out of the six millions of visits to the building were from persons induced to come to London by the Exhibition; and the increase in the travellers was nearly four per cent.

Assuming the figures in the table to be tolerably correct, there will be 10,300 miles of railway open in 1862, with 17,000 travellers, in round numbers, to each mile. An increase of four per cent on this would be 680 per mile, instead of 468, or seven millions in 1862, against three millions in 1851.

It is, however, absurd to suppose that the country visitors to the Exhibition were only those who came to London on purpose. A large, and perhaps a larger portion, must have consisted of persons who come daily to their business in London from the vicinity, or whom other pursuits may have called to London, and it is but a very moderate supposition that another four per cent of the railway journeys of the year 1851 represented the ordinary travellers from the country who visited the Exhibition.

Thus there would be, supposing the attraction equal in 1862, fourteen millions of railway journeys by visitors to the Exhibition, against six millions in 1851, and, therefore, allowing two journeys, one up and one down, to each visitor—seven millions of country visitors instead of three millions—and the Exhibition of 1862 may afford to be less attractive by one half, and yet command an equal numerical and pecuniary support from the country.

Assuming the remainder of the visitors of 1851 to be Londoners, and that they will increase in 1862, in proportion to the present metropolitan population, there would be four millions instead of three for London, and seven millions instead of three for the country, which gives good ground for supposing that if the Exhibition of 1851 had taken place in 1862, it would have received eleven million visits instead of six millions. These calculations, it is almost needless to say, apply exclusively to English railways.

The general system of railway management is much improved since 1851. The continental managers have now learned to appreciate through booking, return tickets, and excursion traffic at reduced rates, which they would not look at a few years back. Many continental lines have been opened since the year of the Great Exhibition, all more or less conveying towards this country. The steam passages between America and Europe are now made in less time, and at fares reduced at least thirty per cent. The chain of railways now joining New York, Boston, Portland, and Quebec, has been tripled since 1851; the distance between London and India—measured by time—has been decreased twenty-five per cent.; and between England and Australia, fifty per cent.; the time taken for passages to and from our West Indian colonies has been diminished one third, and we have a well-organized steam communication with Africa and the Pacific, which did not exist in 1851.

Looking at these facts and figures, guarantors of the forthcoming Exhibition need not expect to be called upon to make good any deficiency, nor need the contractors tremble for the large sum which they have agreed to draw out of contingent profits. With railway facilities increased fifty per cent., with a population not only much changed and much advanced, but increased twenty per cent., and with the consequent increase of capital to that extent, there can be no doubt that the Exhibition of 1862 will become a great and splendid success.

EFFERVESCING CARBONATE OF IRON.

In the last number of the *Chemist and Druggist* we noticed some very well made effervescing Chalybeates. As some of our readers are anxious to know the exact mode of forming these elegant aperients, we insert Dr. T. Skinner's formula for this preparation.

℞ Acid. Tart., ℥iij
Sod. Bicarb., ℥v
Ferri Sulpas., ʒx
Pulv. Sacch. Alb., ℥i ʒvi
Acid. Citric, ʒij.

First. Mix the sulphate of iron with the sugar, and part of the tartaric acid.
Secondly. Mix the citric acid with remainder of the tartaric acid, and bicarbonate.
Thirdly. Stir the two mixtures together, and thoroughly unite them by sifting.
Lastly. Put the whole into an open metal vessel in a water bath, and stir until it is well

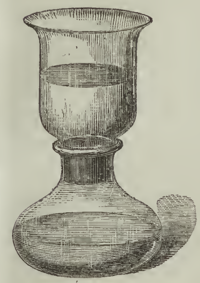
granulated. In these proportions there are ten grains of sulphate of iron in every drachm and a half; this will produce, by double decomposition, four grains of pure protocarbonate of iron.

It is almost needless to observe that the materials employed should be finely powdered, very dry, and that the preparation should be kept from the air and moisture by being preserved in well-stopped bottles.

LUNAR CAUSTIC POINTS.

In reprinting our notice of the Tough Lunar Caustic Points,* the Editor of the *American Journal of Pharmacy* remarks that "Dr. E. R. Squibb manufactures conical pieces of Lunar Caustic, made tough by chloride of iron." Probably, in this case, chloride of silver is formed, which is the toughening material; this, in small quantity, would not interfere with the action of the nitrate of silver.

NEW BED-ROOM FILTER.



The Silicated Carbon Company have just issued a new filter, which is in many respects an improvement on the form in general use. In the old design, the filtering block was connected with the upper vessel by means of a glass tube and a couple of perforated corks; this arrangement was objectionable, not only on account of the number of joints, which frequently were not water-tight, and so permitted the fluid to pass through without filtration, but from the introduction of cork, an organic substance capable of decay. Both these inconveniences have been avoided in the new design, in which the filtering medium is let into a recess sunk in the lower part of the upper vessel, as shown in the engraving; there is, consequently, no necessity for the employment of corks or connecting tubes, and thus the complicated arrangements, which were always apt to get out of order, are entirely abolished. The filter is made of a small handy size, especially adapted for the dressing-table, and would, we should imagine, meet with a ready sale as a very desirable toilet appendage.

ON THE EMPLOYMENT OF THE MORE VOLATILE MINERAL HYDROCARBONS AS ANÆSTHETICS.

Mr. Edward Parrish, whose valuable contributions to pharmaceutical science have so frequently been noticed in our pages, has published a paper in the *American Journal of Pharmacy* on the employment of the more volatile mineral hydrocarbons as anæsthetic agents.

The discovery of the effects of these agents on consciousness was accidentally made by observing their action on a workman who was employed to clean out a cistern in the Kerosene Oil Works, at Boston. Subsequently some samples of the more volatile products were forwarded to Mr. Parrish for the purpose of examining into their effects. The specific gravity of the liquids was under ·6400, the odour faint, and somewhat resembling chloroform. Like all other hydrocarbon products they are evidently very compound in character, as they commenced boiling at 84° Fahrenheit, the boiling temperature gradually rising to about 200° as the more volatile parts were distilled. These liquids, which are termed kersolene, are much lighter and more mobile than benzine, and of less specific gravity than even eupion, which was formerly regarded as the lightest of all known liquids.

Kersolene appears adapted to all the uses to which benzine can be applied, and is superior to it as being destitute of odour; it is obviously not adapted to illuminating purposes by reason of its extraordinary volatility.

The anæsthetic effects produced by the inhalation of its vapour (although in some cases perfect anæsthesia was produced) were somewhat uncertain, and generally followed by headache, and in one or two instances, an unpleasant amount of muscular rigidity and asphixia were produced. These, and the fact of the great uncertainty of its composition, as being a mixture of different proximate principles in irregular and undetermined quantities, will, of necessity, interfere with its general adoption, and should lead to great caution in making experiments on any substances of the same class.

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* See present vol., p. 183.

THE MONTH

CHEMICAL PRODUCTS AT THE BRITISH ASSOCIATION MEETING.

A beautiful collection of chemicals was exhibited in the Chemical Section of the British Association, at its meeting in Manchester. We describe the most remarkable. The collection was arranged under the superintendence of Dr. Roscoe and Mr. Charles O'Neill, and the object was to show the process of the manufacture of the various chemicals, and the manner in which they are adapted to commercial purposes. Mr. Spence, of Newton Heath, contributed a very fine block of crystallised alum, together with the substances from which it is obtained, namely, shale from the coal measures, Spanish pyrites and ammonia from gas works. Messrs. Crook and M'Kinnon, manufacturing chemists, Manchester, exhibited a splendid crystallised block of ferricyanide of potassium of a beautiful dark yellow colour. By some persons this was regarded as the gem of the collection. Some red and yellow chromates of potash in the crystallised state were exhibited by Messrs. Dentith and Co., manufacturing chemists, Manchester, who also showed the chrome ores from which they are manufactured. The same firm also contributed some ferricyanide of potassium, nitrate of lead, chloride of ammonia, and sulphate of copper. Numerous specimens, illustrating the process of the alkali manufacture, were furnished by Messrs. Hutchinson and Earle, alkali manufacturers, Widness Dock, near Warrington; amongst them were some magnificent crystals of bicarbonate and carbonate of soda. Messrs. Gaskell, Deacon, and Co., of Wood End Chemical Works, Widness Dock, near Warrington, also contributed pseudo-morphous crystals, or bicarbonate of soda, together with refined soda ash, or alkali, and commercial anhydrous carbonate of soda; also some beautiful crystals of decahydrated monocarbonate of soda, producing bicarbonate of soda, besides specimens of bleaching powder composed of dressed lime, hydrochloric acid, and Spanish manganese; each of these component parts being also shown separately. Several blocks of rock salt were sent by Messrs. Fletcher and Rigby, together with specimens of steam-made Cheshire salt in its various stages of manufacture. Some fine crystals of chlorate of potash were exhibited by Mr. F. Muspratt, of the Wood End Soda Works, Manchester; whilst Mr. B. W. Gerland, of Widness Dock, sent some specimens of chloride of manganese, and peroxide of manganese. In a large glass retort for sulphuric acid, Messrs. Roberts, Dale, and Co., of Cornbrook, Manchester, had a numerous and interesting collection. First, there were samples of colours manufactured at their works; next, materials illustrating the manufacture of oxalic acid from sawdust; then, some beautiful crystals of hyposulphate of soda or antichlore; also some new aniline colours with dyed specimens of wool showing their quality. These colours comprise the mauve, magenta, and many others; and have all been obtained from aniline, a production from coal tar by the patented process of Mr. J. Dale and Mr. Heinrich Caro. Besides these, Messrs. Roberts, Dale, and Co. sent numerous samples of chemicals in general use amongst dyers and calico printers. An interesting collection of soap and soluble glass was exhibited by Messrs. Gossage and Sons, patentees and manufacturers, Widness Dock. The soap contains a solution of silicate of soda, combined with the ordinary materials used in the manufacture of soap. The soluble glass is made from two substances exhibited in their pure state, namely, pure silica, in the form of white sand, from the Isle of Wight, and dry carbonate of soda in the form of soda ash. Messrs. Tennant and Co., of Manchester, sent several specimens of copper and other salts, used principally for dyeing purposes; also specimens of chloride of copper. Mr. J. Carsartelli contributed several products from the distillation of gas tar, including naptha, ammonia, muriate of ammonia, and pitch. Some British gums, and gum substitutes used in calico printing, were exhibited by James Laing, George Street, Manchester. Specimens of the same description were also sent by Messrs. James Higgin and Co., of Manchester, besides stannate of soda, and arseniate of soda. Messrs. Thomas Hoyle and Sons sent a quantity of dye-woods, their extracts and mordents, and a quantity of calico prints, to show the application of the different dyes. A number of the pieces show the colours which are obtained from madder and garancine. Messrs. Pincoffs and Co., of Manchester, furnished samples of madder, garancine, commercial alizarine, and other dyes. A very interesting collection of the chemical principles contained in madder, was exhibited by Dr. Schunck, F.R.S., by whom each specimen had been carefully prepared and examined; this case was perfectly unique. Specimens of dye-stuffs and woods were also shown by Messrs. George Whyatt and Son, of Openshaw, including log wood and peach wood (both in bulk and also ground), fustic, sapan wood, lima wood, indigo, safflower, cudbear, annetta, picric acid, &c., together with silk velvets, showing the different colours obtained from these dyes. The same firm exhibited some colours derived from aniline, and also velvets dyed by them. Specimens of dye-woods along with their solid and liquid extracts, were furnished by Messrs. Hervey, Peak, and Hervey, of Salford. Messrs. J. and J. M. Worrall and Co. also sent velvets, dyed by the following substances, which they also exhibited—young fustic, barwood, catechu, ebonywood-chips, divi-divi, and turmeric, Messrs. Roberts, Dale, and Co., Cornbrook, showed a block of barwood, rough and polished. Messrs. J. and T. Johnson, of Salford, exhibited several specimens, showing the different stages of the process of purifying common resin by the patented process of Messrs. Hunt and H. D. Pochin. By this process very dark resin is made perfectly transparent and almost colourless, and can then be very extensively used in soap and other manufactures. The same firm exhibited specimens of resin-spirit and oil, which are rare productions from resin. Mr. James Wooley, Chemist, of Market Street, supplied a number of pharmaceutical preparations. From an establishment at St. Helen's, came some beautiful crystals of chlorate of potash, which reflected the light in so peculiar a manner as to exhibit all sorts of colours; also from the same place some beautiful specimens of nitrate of soda. Messrs. Edmund Buckley and Co., of Manchester, supplied specimens in illustration of the manufacture of sulphate of iron, or green copper. Messrs. Evans and M'Bryde, of St. Helen's, furnished specimens to illustrate the manufacture of copper from different kinds of ore, also some refined caustic soda, and refined soda ash. Dr. P. Pauli, of St. Helen's, exhibited a remarkable specimen of graphite, obtained during the preparation of caustic soda, and derived from the decomposition of the cyanides.

Poisonings.—Several fatal cases of accidental poisoning have occurred during the month. Mr. Capel Hanbury Leigh, of Pontypool Park, the Lord Lieutenant for Monmouthshire, has met his death through the carelessness of his attendants. He was staying at his marine residence, Plymouth House, Penarth, and was suffering from the effects of a slight accident. Two bottles, one containing a draught and the other an embrocation, stood upon the mantelpiece, and by a fatal mistake the poisonous liquid was given to the deceased. Mr Leigh was in his eighty-first year, and was highly respected by the inhabitants of the county in which he resided.—At Carlisle, a child, four years of age, named William Hoodless, was killed by strychnine, through the culpable mismanagement of a Dr. Hendrie. At the inquest, this licensed prescriber stated that he meant to administer powders for worms from santonine. In his surgery, however, the santonine bottle and the strychnine bottle stood together. Both were covered with blue paper, and both were labelled, but the rain had got in and destroyed the writing. He had, in consequence, taken up and used the wrong bottle. The jury found that the child had died from strychnine inadvertently administered by Dr. Hendrie. They recommended that "he and all other doctors should have their bottles properly labelled."—At Cardewless, a village not far from the town where the above case occurred, an inquest was lately held on the body of a girl named Sarah Carrick, who had poisoned herself with phosphoric paste or rat-poison.

International Exhibition of 1862.—The Chemical and Pharmaceutical department will be particularly well filled. It could not be otherwise with a national committee consisting of Faraday, Brande, Graham, Hofmann, Warren de la Rue, W. A. Miller, Lyon Playfair, Redwood, and Stenhouse, besides a London trade committee, having the names of S. L. Howard, Henry Coe, Heywood, Bastick, D. Hanbury, S. Piesse, and C. Davy, on its roll. The pharmaceutical division will be under the direction of Dr. Redwood, in conjunction with the Pharmaceutical Society, which will exhibit a complete series of preparations. The chemical manufactures, more especially the brilliant new dyes obtained from coal tar, will be exhibited in great abundance. An effort is about to be made to form a systematic collection of chemical products of a purely scientific nature, and we trust that it may be crowned with success. In the Exhibition of 1851, as well as in that of Paris, the technological department of chemistry was adequately represented, but the display of such substances as the alkaloids, the rare salts, and the elementary bodies, was singularly meagre. Should the proposed collection be formed, it will afford the chemical student an opportunity of examining substances which, from their rarity, he can hardly hope to see again. The interest with which he will regard these bodies will be considerably heightened by the knowledge that they have been prepared by the greatest chemists of the day.

The Exhibition Agency.—The want of a suitable and competent agency, prepared to undertake the *receiving*, *unpacking*, *fitting up*, and *re-packing* of goods, and other incidental operations required by foreign and colonial exhibitors, in connection with the exhibition of articles of their produce or manufacture, was severely felt in the former Great London Exhibition, as well as in the Paris one of 1855. We are glad to find that such an agency has been established, and that the affairs of the foreign and colonial exhibitors of 1862 will be managed by men of standing and respectability, the representatives of a firm which has been in existence for more than half a century. The action of the Royal Commissioners will be supplemented by the labours of the officers of this agency. The projectors propose to provide for the exhibitors an office of inquiry, reception rooms, and the comforts of a home in connection with a first-rate club, within a few minutes' walk of the central office of the Exhibition at Charing-cross, a large staff of interpreters, officials, and messengers being attached to the establishment.

Correspondence

To the Editor of the Chemist and Druggist.

The Right to Prescribe.

Sir,—With great pleasure we witness the discussion in your columns of two important questions, "our right to prescribe," and "early closing." As to the first, no time should be lost, but every lawful effort made to make the public fully acquainted with the monopoly so earnestly desired by *some* of the medical profession. I use the word some, because I do not believe all are so foolish as to imagine that, by fines or imprisonment, they ever can interfere with the public right to go to whom they please and tell their ailment, seeking that relief which implicit faith in the person leads them to believe he can afford, though he may not be M.D., or F.R.C.S., or L.C.A. That the right of a druggist to recommend medicines has been taken away is extremely doubtful. Common law rights outride all enactments, unless special enactments are made to meet the case. What special acts have there been in our case? We may not charge for prescriptions, but surely we may for a quinine mixture, senna sudorific, or other draught, and what legal functionary can deny our right to obtain payment? As well might we be mulcted of the amounts charged for mixtures made from family recipes or private prescriptions not our own. The public are too sensible of the valuable aid afforded by intelligent druggists, to be indifferent to this matter. Let the United Society be encouraged to proceed in vindicating our rights, confined, of course, to our own homes, and the issue will be complete success.

It seems strange that the Pharmaceutical Society should be so apathetic in a matter involving, to many, loss of the very means of subsistence; but the truth is, our aristocratic friends in "town" have not any notion of their country cousins' position. The city chemist may obtain exalted position by patronage in high quarters; prescriptions roll in by hundreds per day, and good prices are obtained; the poor are not frequenters of such premises. Far different is our case. As with the "good master," so with the benevolent chemist, the poor flock to his door; they consult him in almost every emergency, and only at his urgent request will they apply to the M.R.C.S. Why? because the chemist has sympathy which is not generally found elsewhere, and, in many cases, by education and practice, he has qualified himself for the post chosen. There may be dunces among us, some whose judgment is deficient, and therefore are often found mistreating cases. Are there no dunces in the medical profession; no doctors whose qualifications are very poor, discrimination very meagre, and treatment very doubtful?

To degrade the druggist to a mere seller, would have the effect of ruining the business; few youths of education would come forward, as the remuneration would not suffice to encourage them, and eventually the public would find a retrogression instead of progression among chemists.

Let it not be said that our profession cannot combine for their own interests. It is high time to awake out of our sleep; the medical men are active, and they appear anxious for all the plums, as they not only seek their own, but grasp at ours.

Your well-wisher,

A Country Chemist.

Oct. 7th, 1861.

Sir,—I am sure your subscribers are glad to learn, through your last number, that your intention is to go fully into the above subject, and I beg to assure you that the Committee of the United Society is alive to the importance of the question, but it must be supported by the trade with more earnestness and energy than has hitherto been displayed. The right to prescribe is vital to us, and many now considered incompetent to perform the slightest act of an apothecary, formerly acted as assistants to surgeons, carrying out the duties with credit and satisfaction in the absence of their employers, who would have resented with indignation any remark that the assistant not holding a diploma was unfit to visit or prescribe. At the present time, how many surgeons are there employing chemists in their retails and surgeries at such miserable salaries as no qualified men would serve at? If I mistake not, every practitioner allowing a non-qualified assistant to visit or prescribe is acting contrary to law, and as open to prosecution as the much-reviled chemist. Although of such importance to the chemist, the Pharmaceutical Society will not defend this question; so it remains with you, sir, and the United Society to protect the interests of the trade. Then it behoves both M.P.S.'s and non-pharmaceutists to support the Society by adding to its number, as well as to its exchequer, and to remember that although the subscription is limited to 5*s.*, it is by no means necessary to confine it to that amount. Thus supported, the officers of the Society will not fail in their duty.

One of the Committee.

August 22nd, 1861.

Sir,—In your Circular for this month, at page 241, there is a paragraph on "The Right to Prescribe," copied from the *Lancet.* As this is a subject of great importance to many retail druggists, I think we ought to understand correctly the legal or illegal right on the subject. I have not had an opportunity of reading over the last Act of Parliament on the subject, but unless the Act of Parliament for the Apothecaries Company has been repealed, I think the opinion expressed by the Judge of the County Court is decidedly wrong.

I have been engaged in the drug trade ever since the year 1815, when that Act was passed, and it was quite customary for the principals in the shops and the senior assistants engaged, to regularly prescribe to their customers; and it has always been the case in all the situations I have ever lived in since. For your satisfaction I will refer you for the legal right to do so to the *Lancet* of February 28th, 1835, and March, 20th, 1835, in which you will find a correspondence betwixt a Medical Practitioner and the Apothecaries' Company on the subject, and how far the druggist's right extends. I copied the letters at the time for my own guidance, and have acted upon them ever since. As you will have access to that publication of that date, it will not be necessary for me to furnish you with copies of them; but I should like the question to be brought before the London druggists, as it is one of great importance to the retail druggists throughout the country.

I am, Sir, yours respectfully,

* * *

[As our Correspondent distinctly states that his letter is not intended for publication, we reluctantly suppress his name and address.—Ed.]

NOTES AND QUERIES

General Note.—In the present issue so much space has been taken up by articles which could not well be omitted, that we have no room left for replies to our correspondents "Eloquentia candidatus," "An Assistant," K., of Exeter, D. S., "A Subscriber," "A Country Druggist," and others. The information required by each will be given next month.

Determining Bulk of Gas or Air at Different Barometric Pressure and Temperature.—The following communication has been received from one of our subscribers :—

Dear Sir,—Are the following calculations correct?—A cubic foot of air measured off at 80° F., and 31 inches barometric pressure—what will be its volume at 60° F., 30 inches pressure? The greater the pressure, the less the volume; consequently, 30 being the less pressure, the volume will be in proportion, as 30 to 31.

$\therefore$ As 30 : 31 :: 1 : 1·033, the volume of a cubic foot of air at 30 inch pressure.

The greater the amount of heat, the greater the volume :—

$\therefore$ As 80 : 60 :: 1·033 : ·774, the volume of air at 60° F., 30 inches pressure.

By answering me the above, and pointing out any error, you will oblige yours, respectfully,

"Kappa."

Kappa is perfectly right in his mode of ascertaining the alteration of bulk induced by various pressures, but quite in error in his calculation to ascertain the change effected by temperature. Gases expand $\frac{1}{491}$th of their bulk at 32° Fah. (30 inches bar.) for every degree of temperature between 32° Fah. and 212° Fah. If the temperature of the gas be above 32° Fah., multiply its total value by 491, and divide the product by 491, *plus* the number of degrees that the temperature of the gas exceeds 32° Fah.; the numeral result of this operation gives us the correct volume the gas in question would occupy at 32° Fah. For example, we have 100 cubic inches of gas at 50° Fah.; it is required to know what volume this gas would occupy if raised to 60° Fah., thus,—$\frac{100 \times 491}{491 + 18} = 96{\cdot}46$ = the volume at 32° Fah., and $96{\cdot}46 + \frac{96{\cdot}46 \times 28}{491} = 101{\cdot}56$, the volume at 60°.

We shall be glad to receive replies to the following queries :—

Can you give me the address of some alum manufacturers, or the best market for the same, in quantity.—J. C. M.

Please kindly inform me through the "Chemist and Druggist," how silicate of potash is used in mending earthenware, &c.—E. H. L.

"Query" wants a formula for "Farmer's Friend," a dressing for seed wheat, to prevent smut, &c., and wishes to know what weight of the same, for say, six bushels of seed, is to be used. He also requires a formula for "Quinine Pills," to be used as antidote for the ague, intermittents, &c. He asks, "What is the best material for forming them into mass? and what is the best adjuven to facilitate the action of the quinine? also the best material for rolling these pills in?"

TRADE REPORT.

London, 12th Oct., 1861.

The abundance of money, and the trifling demand for accommodation, has had the effect of causing a further reduction in the rate of discount; the Bank Directors lowered the rate on the 19th ultimo from 4 to 3½ per cent. On the other hand, the Bank of France has raised their rate 1 per cent., and it is expected that large quantities of gold will be taken from here, which leads to the expectation of an advance here shortly. The best paper, in Lombard-street, is discounted at 3 to 3⅛ per cent. Trade here has steadily improved, but in the manufacturing districts business is very slack; and the unsettled and uncertain state of the American affairs is not likely to mend matters. Consols are now 92½ ⅝ for money, and 92¾ ⅞ for the account.

The market for chemicals has continued very quiet. Only small sales have been made in tartaric acid at 1*s.* 8½*d.* Rather more business has lately been done in citric at 1*s.* 9*d.* Prussiate of potass is dull at 1*s.* 1*d.*, which is lower. Bichromate is in moderate demand at 9*d.* Oxalic acid is quiet at 9*d.* for firsts, but seconds are more in request. Iodine remains at 4½*d.* to 5*d.* Flour of sulphur has sold to a good extent at firm prices. Soda ash is quieter at 4*l.* 15*s.* ex ship. Sulphate of copper is dull, and only small sales to be made in cream tartar at 120*s.* Linseed oil is firm at 34*s.* to 34*s.* 3*d.* Turpentine is rather more in demand at the reduced rate of 61*s.* 6*d.* for American. Pot and pearl ashes are quiet at 31*s.* and 36*s.* per cwt.

The sales in the drug market have been rather more numerous. Castor oil has sold more steadily at full prices. Oil of Cassia has declined to 8*s.* 11*d.* and 9*s.* Oil of aniseed has sold to a large extent at 6*s.* 3*d.* and 6*s.* 6*d.* on the spot, and 6*s.* for arrival. Senna is without change. Barbadoes and Cape aloes have brought former prices. Star aniseed is 3*s.* to 5*s.* lower, sales being made at 60*s.* and 62*s.* Gums are generally without change. A few lots of fine jalap have brought 4*s.* 8*d.* and 4*s.* 9*d.* Safflower is about 5*s.* dearer. Indigo is fully 9*d.* to 1*s.* 6*d.* dearer than the last sales. Camphor is dull at 11*l.* 10*s.* Bees' wax is quiet, and only small sales in good Japan blocks at 58*s.* Fine Turkey opium is more in request at 15*s.* and 16*s.* In other goods there is no change to notice.

PRICE CURRENT.

☞ *These quotations are the latest for* ACTUAL SALES *in Mincing Lane. It will be necessary for our retail subscribers to bear in mind that they cannot, as a rule, purchase at the prices quoted, inasmuch as these are the* CASH PRICES IN BULK. *They will, however, be able to form a tolerably correct idea of what they ought to pay.*

	1861.				1860.			
	s.	d.	s.	d.	s.	d.	s.	d.
ARGOL, Cape..per cwt.	95	0..	105	6	90	0..	105	0
French	60	0..	85	0	60	0..	85	0
Oporto, white	0	0..	0	0	0	0..	0	0
red	45	0..	0	0	50	0..	52	0
Sicily	65	0..	80	0	75	0..	80	0
Naples, white	65	0..	80	0	85	0..	90	0
red	0	0..	0	0	0	0..	0	0
Florence, white	90	0..	100	0	95	0..	105	0
red	85	0..	87	6	85	0..	95	0
Bologna, white	115	0..	120	0	125	0..	130	0
ARROWROOT,								
duty 4½d. per cwt.								
Bermuda ....per lb.	0	10..	1	3	1	1..	1	6
St. Vincent	0	2½..	0	6	0	2¾..	0	6
Jamaica	0	2½..	0	4½	0	2 ..	0	4¼
Other West India ..	0	2..	0	3¼	0	2..	0	3¼
Brazil	0	1½..	0	2¼	0	1½..	0	2¼
East India	0	1¾..	0	2½	0	1¾..	0	2½
Natal	0	2½..	0	6	0	3 .	0	6½
Sierra Leone	0	2½..	0	3	0	2½..	0	3½
ASHES,......per cwt.								
Pot, Canada, 1st sort	31	0..	0	0	32	0..	33	0
U. S., 1st sort	0	0..	0	0	0	0..	0	0
Pearl, Canada, 1st sort	36	0..	0	0	32	0..	32	6
U. S., 1st sort	0	0..	0	0	0	0..	0	0
BRIMSTONE,								
rough ......per ton	£7	10..	0	0	£10	0..	10	5
roll	13	10..	14	0	14	10..	0	0
flour	14	0..	14	10	16	10..	17	0
CAPERS,								
French,.....per cwt	£3	0..	£5	0	£3	0..	£5	0

	1861.				1860.			
CHEMICALS	s.	d.	s.	d.	s.	d.	s.	d.
Acid—Acetic, per lb.	0	3½..	0	4	0	4..	0	4½
Citric	1	8½..	1	9	1	11 ..	2	0
Nitric	0	4½..	0	5	0	5..	0	5½
Oxalic	0	8¼..	0	9	0	8 ..	0	0
Sulphuric	0	0¾..	0	1	0	0¾..	0	1
Tartaric, crystal	1	8½..	0	0	1	10½..	1	11½
powdered.	1	9¼..	1	9½	2	0 ..	2	1
Alum ......per ton	£6	10	£0	0	£7	0	£7	5
powder	7	10..	0	0	8	10..	0	0
Ammonia, Carbon, lb.	0s.	5¾d.	0	6d.	0s.	6½d.	0	6¾
	£	s.	£	s.	£	s.	£	s.d
Sulphate ..per ton	13	10..	14	5	13	10..	14	10
Antimony, ore......	16	0..	17	0	16	0..	17	0
crude, per cwt..	30s.	0d.	0s.	0d	35s.	0d.	37s.	0
regulus	50	0..	51	0	53	0..	54	0
French star	51	0..	0.	0	52	0..	54	0
Arsenic, lump	17	6..	18	3	18	0..	0	0
powder	9	6..	10	0	12	0..	13	0
Bleaching Powder ..	9	0..	9	6	11	0..	11	3
Borax, E. I. refined..	35	0..	45	0	0	0..	0	0
British	65	0..	0	0	65	0..	0	0
Brimstone, roll......	13	10..	14	0	14	10..	0	0
flour	14	0..	14	6	16	10..	17	0
Calomel......per lb.	2	9..	0	0	2	10..	0	0
Camphor, refined ..	2	10..	3	2	2	3..	0	0
Copperas, green, pr tn.	60	0..	65	0	65	0..	0	0
Crrsiv. Sublimate, lb.	1	11..	2	0	2	1..	0	0
Green, Emerald, pr lb.	0	9..	0	11	0	9..	1	0
Brunswick, cwt..	14	0..	42	0	14	0..	42	0
Iodine, dry ..per oz.	0	4½..	0	5	0	5¾..	0	5¾
Ivory Blk. drop pr. ct.	8	0..	9	0	0	0..	0	0

PRICE CURRENT—*continued.*

	1861.				1860.			
CHEMICALS.	s.	d.	s.	d.	s.	d.	s.	d.
Magnesia, Carbon. ct.	42	6..	45	0	42	6..	45	0
Calcined, lb.....	1	2..	2	0	1	6..	0	0
Minium, red, per cwt.	21	6..	0	0	23	6..	24	0
orange	35	0..	0	0	36	0..	0	0
Potash, Bichrom., lb.	0	9 ..	0	0	0	10½..	0	10¾
Chlorate........	0	10..	0	10¼	0	10½..	0	11
Hydriodate ..oz.	0	5½..	0	5¾	0	6 ..	0	6¼
Prussiate ....lb.	1	0½	1	1	1	3..	0	0
red..	1	11..	2	1	2	3..	0	0
Precipitate, red per lb.	2	9..	2	10	2	10..	2	11
white....	2	10..	0	0	2	10..	0	0
Prussian Blue	1	6..	1	10	1	6..	1	10
Rose Pink ..per cwt.	29	0..	30	0	29	0..	30	0
Sal-Acetos....per lb.	0	10..	0	10½	0	10½..	0	0
Ammoniac, cwt.								
British ..	31	0..	33	0	32	6..	34	0
Epsom	8	0..	0	0	8	3..	8	6
Glauber	3	9..	5	6	5	0..	5	6
Saltpetre, refined....	36	6..	37	6	42	0..	43	6
Soda, Ash, per degree	0	2⅛..	0	2¼	0	2⅝..	0	2⅞
Bicarbonate ...cwt.	12	0..	13	0	15	0..	0	0
Crystals....per ton	£4	15/	£5	0/	£4	15/.	£0	0
Sugar Lead, white, ct.	36s.	0d.	37s.	0d.	0s.	0d.	39s.	0d.
brown..........	26	0..	27	0	28	0..	0	0
Sulphate Quinine, oz.								
British in bottle ..	7	0..	0	0	8	2..	8	6
Foreign	6	6..	6	9	7	9..	8	0
Sulphate Zinc ...cwt.	14	6..	15	0	14	6..	15	0
Verdigris ....lb.	1	3..	1	5	1	3..	1	5
Vermillion, English..	3	0..	3	4	3	6..	3	4
China....	2	1..	2	3	2	10..	3	2
Vitriol, blue or Roman								
per cwt...	31	6..	32	0	34	6..	35	0
CHICORY....per cwt.								
Foreign (duty, 6s.) ..	17	0..	17	6	13	0..	13	6
COCHINEAL...per lb.								
Honduras, black....	2	10..	4	8	3	0..	5	2
silver	2	6..	3	6	3	0..	3	9
pasty	1	6..	2	5	2	10..	2	11
Mexican, black......	2	8..	3	2	3	2..	3	11
silver......	2	2..	2	6	3	0..	3	3
Lima	2	6..	3	4	3	0..	3	9
Teneriffe, black	2	9..	3	4	3	5..	4	0
silver	2	8..	2	9	3	1..	3	4
COCOA (duty 1d. per lb.)								
Trinidad, red, in bond......per cwt.	58	0..	96	0	70	0..	94	0
gray	54	0..	60	0	64	0..	68	0
Grenada...........	52	0..	60	0	60	0..	67	0
Dominica & St. Lucia	52	0..	54	0	58	0..	62	0
Para	58	0..	64	0	64	0..	68	0
Bahia	52	0..	54	0	54	0..	57	0
Guayaquil	57	0..	58	0	68	0..	70	0
COFFEE, in bond (duty 3d. per lb.)								
Jamaica, good, mid. to f...............	80	0..	100	0	72	0..	94	0
low mid. & mid.	74	0..	78	0	65	0..	70	0
fine ordinary ..	68	0..	72	0	62	0..	64	0
good ordinary ..	66	0..	67	0	59	0..	61	0
ord. and triage..	50	0..	65	0	46	0..	59	0
Ceylon, Nat. gd. & f.	68	6..	70	0	61	6..	65	0
ordinary	63	0..	67	0	57	0..	61	0
Plantation, fine..	86	0..	90	0	86	0..	90	0
fine mid.	82	0..	85	0	79	0..	85	0
good mid.......	79	6..	81	0	75	0..	78	0
middling	75	0..	78	6	70	0..	74	0
fi. ord. to low mid.	70	0..	74	0	66	0..	69	0
mixed and triage	50	0..	70	0	50	0..	65	6
Malabar and Mysore	66	0..	78	0	57	0..	78	0
Madras	66	0..	80	0	58	0..	76	0
Tellicherry	70	0..	90	0	62	0..	89	0
Mocha, fine	120	0	130	0	112	0	123	0
garbled	93	0	105	0	94	0	110	0
ungarbled	68	0..	100	0	62	0..	86	0
Batavia, yellow	70	0..	75	0	65	0..	78	0
pale and mixed..	66	0..	68	0	56	0..	64	0
Sumatra............	58	0..	64	0	50	0..	53	0
Padang	60	0..	66	0	54	0..	58	0
African	66	0..	80	0	80	0..	90	0
Brazil, f. ord. & wshd.	58	0..	72	0	60	0..	72	0
good ord.	54	0..	56	0	57	0..	61	0
ordinary	47	0..	53	0	51	0..	57	0
COFFEE.	s.	d.	s.	d.	s.	d.	s.	d.
La Guayra	70	0..	78	0	62	0..	78	0
Costa Rica, mid. to f.	70	0..	80	0	68	0..	82	0
good and f. ord.	66	0..	69	0	62	0..	68	0
Cuba, mid. to fine ..	67	0..	80	0	68	0..	82	0
f. ord. & f. f. ord.	63	0..	66	0	62	0..	68	0
ord. & good ord.	60	0..	62	0	55	0..	62	0
Porto Rico	65	0..	78	0	62	0..	78	0
St. Domingo........	60	0..	67	0	56	0..	65	0
DRUGS,	£.	s.	£.	s.	£.	s.	£.	s.
Aloes, Hepatic, pr. cwt.	5	10..	8	0	3	10..	9	10
Socotrine	8	0..	24	0	5	10..	24	10
Cape, good......	2	0..	2	3	1	15..	1	18
inferior ..	1	0..	1	16	1	2..	1	14
Barbadoes......	3	0..	21	0	2	0..	23	10
Ambergris, gray, p. oz.	35s.	0d.	38s.	0d.	35s.	0d.	42s.	0d.
Angelica Root. pr. cwt.	20	0..	35	0	35	0..	42	0
Aniseed, China star ..	65	0..	75	0	78	0..	82	6
German, &c.	22	0..	42	0	32	0	43	6
Balsam, Canada, pr. lb.	1	4..	0	0	1	3..	0	0
Capivi	1	8..	1	9½	1	11..	2	0½
Peru........	4	7..	4	8	4	10..	0	0
Tolu	3	6..	3	8	3	8..	3	9
Bark, Cascarilla, cwt.	25	0..	49	0	26	0..	44	0
Peru. crwn. & gry. pr. lb.	1	2..	2	6	1	7..	3	2
Calisaya, flat ..	3	6..	3	9	5	3..	5	6
quill ..	3	4..	3	6	5	0..	5	3
Carthagena	0	10..	2	0	1	2..	2	0
Pitayo	1	6..	2	2	1	4..	2	3
Red	2	0..	6	0	2	2..	6	0
Bay Berries, per cwt,	22	0..	40	0	22	0..	40	0
Borax..............	18	0..	45	0	20	0..	37	6
Tincal	20	0..	48	0	30	0..	48	0
Bucca Leaves ....lb.	0	3½..	1	6	0	5..	1	2
Burgundy Pitch, p. cwt.	0	0..	0	0	0	0..	0	0
Camomile Flowers..	40	0..	90	0	140	0	190	0
Camphor, China....	220	0	230	0	150	0..	0	0
Canella Alba........	20	0..	40	0	25	0..	46	0
Cantharides ..per lb.	2	1..	2	2	3	1..	3	2
Cardmms. Mlbr. good	4	6..	5	1	4	7..	4	10
inferior ..	3	10..	4	3	4	2..	4	6
Madras ..	3	4..	4	4	2	10..	4	3
Ceylon ...	3	0..	4	0	3	6..	3	9
Cassia Fistula, pr. cwt.	13	0..	23	0	28	0..	38	0
Castor Oil, 1st pale, lb.	0	6¼	0	6½	0	6..	0	6½
second	0	5½	0	6	0	5½	0	5¾
infr. and dark	0	4¾	0	5¼	0	5..	0	5¼
Bombay, in casks	0	4¼	0	5	0	3½	0	4
Castorum	1	0..	28	0	5	0..	20	0
China Root..per cwt.	9	0..	10	0	9	0..	10	0
Coculus Indicus	15	0..	16	0	15	0..	16	0
Cod-liver Oil, per gal.	5	0..	6	6	4	9..	7	6
Colocynth, apple, p. lb.	0	8..	1	2	0	11..	1	9
Colombo Root, per cwt.	15	0..	47	6	10	0..	40	0
Corosus Nuts, per cwt.	13	0..	23	6	14	0..	27	6
Cream Tartar, per cwt.								
French	120	0..	0	0	137	6	140	0
Venetian	122	6..	0	0	142	6..	0	0
gray	112	6	115	0	125	0	127	6
brown..........	105	0	110	6	118	0	120	0
Croton Seed........	90	0	105	0	70	0..	80	0
Cubebs	150	0..	0	0	220	0	230	0
Cummin Seed	36	0..	42	0	30	0..	32	0
Dividivi...........	13	0..	14	0	11	6..	12	6
Dragon's blood, reed.	£8	0	£12	0	£7	0	£14	0
lump	3	10..	10	0	5	5..	13	0
Galangal Root......	0	16..	20	0	1	6..	1	8
Gentian Root	0	15..	0	17	0	16..	0	17
Ginger, preserved, in bd.	s.	d.	s.	d.	s.	d.	s.	d.
(duty 2d. lb.) per lb.	0	4..	0	6	0	9..	0	9½
Guinea Grains. per cwt.	50	0..	52	6	60	0..	65	0
Honey, Narbonne ..	60	0..	85	0	70	0..	95	0
Cuba	25	0..	36	0	26	0..	38	0
Jamaica	20	0..	60	0	38	0..	77	0
Ipecacuanha, per lb..	4	0..	4	3	4	3..	0	0
Isinglass—								
Brazil............	1	0..	4	0	1	10..	4	3
East India........	0	8..	3	0	1	10..	4	1
West India	3	2..	3	7	3	9..	4	2
Russian, long staple	12	0..	13	0	0	0..	0	0
leaf......	9	6..	12	0	0	0..	0	0
Simovia..	2	0..	2	6	1	6..	2	6
Jalap	1	6..	4	9	4	2..	4	

PRICE CURRENT—*continued.*

	1861.				1860.			
DRUGS.	s.	d.	s.	d.	s.	d.	s.	d.
Juniper Berries, p. cwt.								
German and French	10	0..	10	6	9	0..	9	6
Italian	10	0..	12	0	9	0..	10	0
Lemon Juice, per deg.	0	0¾..	0	1	0	0⅞..	0	0
Lichen Islandicus, lb.	0	0..	0	0	0	0..	0	0
Liquorice... per cwt.								
Spanish	83	0..	90	0	83	0..	93	0
Italian	85	0..	95	0	90	0..	98	0
Macaroni, Genoa, p. lb.	0	3..	0	6	0	3..	0	6
Naples....	0	4..	0	5½	0	4..	0	5½
Manna, flaky	2	6..	3	0	4	9..	5	3
small	1	6..	2	0	2	0..	2	3
Musk ....per oz.	20	0..	32	0	24	0..	35	0
Myrabolans, per cwt.	8	6..	12	0	9	6..	13	6
Nux Vomica........	8	0..	8	6	13	6..	14	6
Opium, Turkey	14	0..	16	0	16	6..	19	0
Egyptain....	6	0..	13	0	6	0..	13	6
Orris Root.. per cwt.	27	0..	29	6	28	0..	31	0
Pellitory Root	0	0..	0	0	0	0..	0	0
Pink Root....per lb.	1	10..	1	11	1	0..	1	3
Quassia (bit. wd.) ton	£3	10..	4	0	£4	0	£5	0
Rhatania Root.. p lb.	0s.	10d.	1s.	0d	0s.	6d.	1s.	2d
Rhubarb, China, rnd.	0	9..	2	6	1	0..	2	9
flat..	1	0..	2	9	1	2..	3	0
Dutch, trimd.	3	0..	3	6	3	3..	3	6
Russian	11	6..	0	0	13	6..	14	6
Saffron, Spanish	54	0..	56	0	52	0..	55	0
Salep......per cwt.	£9	0s.	£10	10	£9	0	£12	0
Sarsaparilla, Lima..	0s.	11d..	1s.	4d	0s.	10d..	1s.	2d
Para	0	10..	1	3	0	10..	1	2
Honduras	0	11..	1	6	0	11..	1	6
Jamaica .	1	3..	2	3	1	3..	2	6
Sassafras....per cwt.	10	0..	12	0	10	0..	12	0
Scammony .. per lb.								
virgin	28	0..	35	0	28	0..	34	0
second	14	0..	24	0	14	0..	24	0
Seedlac	60	0..	90	0	42	0..	60	0
Seneka Root........	2	8..	2	9	2	2..	2	3
Senna, Calcutta	0	1½..	0	2½	0	2..	0	2½
Bombay	0	1½..	0	3	0	2..	0	4
Tinnevelly	0	2 ..	0	11½	0	4..	0	8½
Alexandria	0	4..	0	6½	0	4..	0	7
Shellac, orange, pr. ct.	200	0	220	6	205	0..	212	6
liver & garnet.	165	0	190	0	200	0..	210	0
block	140	0	160	0	185	0..	200	0
bttn. dk. to mid.	130	0	155	0	175	0..	190	0
good and fine..	160	0	200	0	195	0..	210	0
Snake Root	1	8 ..	1	9	1	2..	1	3
Spermaceti, refined..	1	0..	1	1	1	6..	0	0
Squills	0	1..	0	0	0	2..	0	4
Sticklac	70	0..	95	0	60	0..	90	0
Tamarinds, E. India.	10	0..	12	0	7	6..	10	0
W.I. per cwt.	15	0..	32	0	16	0..	36	0
Terra Japonica,								
Gambier.. per cwt.	17	0..	18	0	17	3..	18	0
Cutch	21	6..	23	0	26	6..	27	0
Valerian Root, Engl.	20	0 .	40	0	20	0..	40	0
Vanilla,								
Mexican .. per lb.	20	0..	45	0	35	0..	75	0
Brazil............	0	0..	0	0	0	0..	0	0
Wormseed ..per cwt.	2	0..	0	0	1	0..	0	0
FARINA, Scotch	20	0..	25	0	16	0..	16	6
GUM ....per cwt.	£.	s.	£.	s.	£.	s.	£.	s.
Ammoniac, drop	3	10..	5	5	2	15..	5	0
lump....	0	15..	2	0	0	15..	2	0
Animi, fine pale	15	0..	16	0	14	10..	16	0
bold amber..	13	0..	14	0	13	0..	16	0
medium	8	10..	11	0	8	10..	11	10
small & dark.	5	0..	8	5	5	0..	8	0
ordinary dark	2	10..	5	0	2	10..	5	0
Arabic, E.I.f. palepickd	2	10..	2	17	2	13..	3	3
unsorted, good to f.	1	18..	2	10	1	18..	2	10
red and mixed	1	4..	1	10	1	8..	1	16
siftings	0	0..	0	0	0	18..	1	3
Turkey, pkd. gd. to fi.	5	10..	7	5	5	10..	7	10
second & infr.	2	2..	5	5	2	5..	5	5
in sorts	1	10..	2	3	1	16..	2	3
Gedda	1	4..	1	5	1	4..	1	6
Barbary, white......	1	10..	1	12	1	12..	1	14
brown	1	7..	1	8	1	8..	1	11
Cape	0	16..	0	18	0	15..	0	18
Assafœtida, fair to gd.	1	10..	5	0	1	0..	4	5
Benjamin, first qual.	18	10..	33	0	18	0..	35	0
GUM.	£.	s.	£.	s.	£.	s.	£.	s.
Benjamin, 2nd qual.	10	0..	20	10	8	0..	16	10
3rd ,,	2	10..	9	10	3	0..	7	10
Copal, Angola red ..	5	0..	6	5	4	10..	4	15
pale..	4	5..	5	5	3	6..	4	10
Benguela	4	0..	5	10	3	10..	4	5
Sierra Leone lb.	0s.	7d.	1s.	9d	0s.	9d.	1s.	9d
Manilla, pr. ct.	12	0..	40	0	15	0..	43	0
Dammar, pale, pr. ct.	36	0..	48	0	44	0..	48	0
	£.	s.	£.	s.	£.	s.	£.	s.
Galbanum..........	7	0..	9	0	7	0..	9	0
Gamboge, pkd. pipe .	7	0..	8	0	6	0..	7	10
in sorts ..	4	0..	5	10	4	10..	5	10
	s.	d.	s.	d.	s.	d.	s.	d.
Guaiacum ....per lb.	0	7..	1	6	0	10..	1	9
Kino ...... per cwt.	100	0..	140	0	95	0..	120	0
Kowrie	16	0..	20	0	13	0..	15	6
Mastic, pkd., per lb..	6	6..	7	6	8	6..	9	6
Myrrh, gd. & fi., pr. ct.	140	0	180	0	160	0	220	0
sorts	80	0	130	0	90	0	150	0
Olibanum, pale drop.	60	0..	66	0	60	0..	68	0
amber & yellow	40	0..	54	0	40	0..	54	0
mixed & dark..	10	0..	26	0	12	0..	26	0
Senegal	40	0..	46	0	28	0..	33	0
Sandrac............	75	0	100	0	90	0	117	6
Tragacanth, leaf	180	0	340	0	190	0	340	0
in sorts .	100	0	130	0	100	0	126	0
LAC DYE, per lb. D. T.	1	9 ..	1	10	1	10½..	2	0
B Mirzapore........	1	6..	1	7	1	7..	1	8
Other good and fine..	1	0..	2	5	1	2..	2	3
Ord. & Native marks	0	1½..	0	11	0	2 ..	0	11
OILS..........per tun	£.	s.	£.	s.	£.	s.	£.	s.
Seal, pale	40	0..	0	0	34	0..	0	0
yellow	32	0..	34	0	31	10..	32	0
brown	31	0..	0	0	30	0..	0	0
Sperm, body........	91	0..	92	0	102	0	103	0
headmatter	91	0..	0	0	102	0 .	104	0
Cod...............	34	0..	35	0	34	0..	0	0
Whale, Greenland ..	0	0..	0	0	37	0..	37	5
South Sea, pale	35	10..	36	0	34	10..	0	0
yellow	33	10..	0	0	32	0..	0	0
brown	31	0..	32	0	30	0..	0	0
E. I. Fish	30	10..	32	0	28	0..	0	0
Olive, Galipoli ..tun	60	0..	0	0	60	0..	0	0
Trieste	59	0..	0	0	58	0..	0	0
Levant	56	0..	57	0	56	0..	0	0
Mogadore	55	10..	56	0	55	10..	0	0
Spanish	58	0..	0	0	60	0..	0	0
Sicily	57	0..	58	0	58	0..	58	10
Florence, pr. ½-chst.	0	19..	1	0	0	16..	0	0
Cocoanut, Cochin, tun	50	0..	51	6	50	0..	50	10
Ceylon....	49	0..	50	0	47	10..	48	0
Sydney ..	40	0..	47	6	42	0..	47	10
Ground Nut and Gin.								
Bombay..........	41	15..	42	0	40	0..	0	0
Madras	44	0..	0	0	42	0..	45	0
Palm, fine	42	0..	44	6	45	0..	0	0
Palm Nut..........	39	0..	0	0	38	6..	39	0
Linseed	34	0..	0	0	39	10..	0	0
Rapeseed, Engl. pale.	46	6..	0	0	43	10..	0	0
brown	44	0..	0	0	41	0..	42	0
Foreign do.	47	0..	48	0	45	0..	46	0
brown	44	0..	44	10	42	0..	0	0
Lard	54	0..	0	0	62	0..	63	0
Tallow	40	0..	0	0	32	0..	0	0
Rosin	0	0..	0	0	7	5..	0	0
OILS, Essential;	s.	d.	s.	d.	s.	d.	s.	d.
Almond, essen. pr. lb.	30	0..	31	0	30	0..	31	0
expressed..	1	0..	0	0	1	0..	0	0
Aniseed	6	4..	6	6	7	3..	0	0
Bay........ per cwt.	122	6..	0	0	122	6..	0	0
Bergamott....per lb.	6	6..	14	0	6	6..	11	0
Cajeputa, bond, pr. oz.	0	1½..	0	1¾	0	1..	0	1¼
Caraway .... per lb.	4	3..	6	0	4	3..	6	0
Cassia..............	8	11..	9	3	11	6..	0	0
Cinnamon (inb.) p. oz.	1	6..	3	0	3	0..	4	3
Cinnamon Leaf	0	2..	0	4	0	2 ..	0	2½
Citronel............	0	4 ..	0	0	0	3¼..	0	3¾
Clove..............	0	4 ..	0	0	0	2½..	0	3¾
Croton	0	3 ..	0	4	0	4¼..	0	4½
Juniper......per lb.	1	10..	4	0	1	10..	4	0
Lavender	2	6..	5	0	2	6..	5	0
Lemon	5	0..	10	6	5	0..	10	0
Lemongrass..per oz.	0	4½..	0	6½	0	5 ..	0	6¼

PRICE CURRENT—*continued.*

	1861.				1860.			
OILS, Essential,	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*
Mace, ex	0	1½	0	2	0	1¾	0	0
Neroli	6	0	9	0	6	0	10	0
Nutmeg	0	1¾	0	2	0	2½	0	3
Orange ......per lb.	7	0	8	0	10	2	11	0
Otto Roses ..per oz.	16	0	25	0	16	0	26	0
Peppermint ..per lb.								
American	7	6	13	6	8	6	14	6
English	33	0	38	0	24	6	30	0
Rhodium ....per oz.	3	9	6	0	3	9	6	0
Rosemary ....per lb.	1	10	3	0	1	10	3	0
Sassafras	3	0	3	6	3	6	3	9
Spearmint	5	0	12	6	5	0	12	6
Spike	1	3	1	6	1	3	1	6
Thyme	1	9	2	6	2	0	3	0
PITCH, British, pr. cwt.	6	6	7	0	6	0	6	3
Swedish	10	6	0	0	10	3	0	0
SALTPETRE, per cwt.								
Bengal, 6 p.c. or under	33	6	34	6	42	6	43	0
over 6 per cent.	32	0	33	0	38	0	42	0
Madras	31	6	33	0	38	0	41	0
Bombay	30	0	31	6	37	6	39	0
British-refined	36	6	37	6	42	6	43	6
Nitrate of Soda	13	6	14	0	13	0	14	0
SEED, Canary ...p. qr.	32	0	48	0	52	0	62	0
Caraway, English, p.c.	23	0	25	0	32	0	36	0
German, &c.	0	0	0	0	30	0	38	0
Clover, English, red..	0	0	0	0	0	0	0	0
white..	0	0	0	0	0	0	0	0
Germ. & French, red	0	0	0	0	0	0	0	0
white..	0	0	0	0	0	0	0	0
Coriander	0	0	0	0	0	0	0	0
East India	0	0	0	0	11	0	12	0
Hemp	48	0	52	0	42	0	44	0
Linseed, English, p. qr.	52	0	56	0	70	0	74	0
Black Sea and Azof	58	0	0	0	53	0	54	0
Calcutta	56	0	60	0	56	0	0	0
Bombay	63	0	66	0	58	6	59	0
Egyptian	56	0	58	0	0	0	52	0
St. Ptrsbg..Morshnk	56	0	58	6	53	0	54	0
Archangel	56	0	57	0	46	0	0	0
Riga	49	0	55	0	43	0	44	0
Mustard, brown, p. bhl	9	0	14	0	0	0	0	0
white	9	0	10	0	9	0	12	0
Niger	50	0	0	0	46	0	47	0
Poppy, E.I. ..per qr.	58	6	59	0	56	0	0	0
Rape, English	0	0	0	0	0	0	0	0
Danube	65	0	0	0	63	0	65	0
Calcutta, fine	61	0	0	0	58	0	0	0
Bombay, Guzerat	68	0	70	0	68	0	69	0
Feroze. & Scinde	62	0	64	0	55	0	61	0
Teel, Sesame or Gngly.	64	0	68	0	60	0	68	0
Cotton ......per ton	7	10	0	0	7	0	7	10
Gnd. Nut Kernels, tn.	315	0	340	0	310	0	320	0
SOAP, Lond. yel. p. cwt.	21	0	36	0	21	0	38	0
mottled	34	0	36	0	36	0	38	6
curd	50	0	0	0	52	0	0	0
Castile	38	0	40	0	37	0	40	0
Marseilles	40	0	41	0	40	0	41	0
SOY, China ..(per gal.)	2	0	2	2	4	0	4	1
Japan	0	8	0	10	1	6	2	0
SPICES, duty free, except pepper,								
Cassia Lignea, p. cwt,	84	0	93	0	80	0	91	0
Vera	12	0	50	0	12	0	53	0
Buds	190	0	0	0	180	0	0	0
Cinnamon, per lb.								
Ceylon, 1st quality.	1	5	2	7	1	4	2	1
2nd ditto ..	1	2	1	10	1	0	1	7
3rd ditto ..	0	9	1	4	0	10	1	2
Tellicherry	0	10	1	0	0	9	1	0
Cloves, Penang	1	1½	1	3	1	0	1	4
Amboyna	0	4½	0	5½	0	4¼	0	5¼
Zanzibar	0	3½	0	4	0	3⅜	0	3⅝
Ginger	£	s.	£	s.	£	s.	£	s.
Jamaica, fine pr. cwt.	7	0	9	10	7	0	10	0
ord. to good	2	10	6	10	3	0	6	0
African	44s.	0d.	45s.	0d.	35s.	0d.	35s.	6d.
Bengal	0	0	0	0	23	6	24	6
Malabar	0	0	0	0	33	0	34	0
Cochin	48	0	105	0	40	0	100	0
Mace, 1st qlty. lb.	1	3	1	6	1	8	2	2
2nd. & infr.	0	9	1	0	1	0	1	6
Nutmegs per lb.								
brown Penang, &c.	0	10	4	0	1	4	4	0
limed	0	10	2	6	1	4	2	4

	1861.				1860.			
SPICES,	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*
Pepper (duty 6d. pr. lb.)								
Black, in bond								
Malabar	0	4¼	0	5¼	0	4⅞	0	5⅛
Aleppee	0	4¼	0	4½	0	4⅛	0	4⅝
Penang & Batavia	0	3½	0	3¾	0	3¾	0	4⅛
Singapore	0	3⅞	0	4⅛	0	4	0	4⅛
White, Tellicherry.	0	10¼	1	5	0	9¾	1	0½
Other sorts	0	6	0	6½	0	6	0	6¾
Cayenne	1	1	1	6	0	10	1	4
Pod, S. Leone pr. c.	27	0	32	0	28	0	33	0
Zanzibar	80	0	94	0	57	0	61	0
Long	32	0	34	0	32	0	38	0
Pimento, mid. to good	0	3	0	3⅛	0	3¼	0	3⅜
ordinary	0	2¾	0	2⅞	0	3⅛	0	0
SPONGE, Turk. f. pkd.	20	0	24	0	20	0	26	0
fair to good	9	0	18	0	9	0	18	0
ordinary ..	3	0	6	0	3	0	8	0
Bahama ..	0	4	1	3	0	3	1	0
TEA (duty 1s. 5d. per lb.) in bond.								
Congou, ordinary	0	7	0	8	1	0½	1	1
good ordinary	0	9	0	10½	1	1¼	1	2½
but middling.	0	11	1	0	1	3	1	4
blackish leaf	1	2	1	4	1	4	1	5
ditto strong	1	6	1	9	1	7	1	10
ditto to extra fine..	1	9	2	8	2	0	2	1
Ning Yong and Oolong	0	10	2	0	1	4	2	2
Souchong, ordinary..	0	10	1	0	1	3	1	5
fair to fine	1	2	1	8	1	5	2	0
finest	2	0	4	0	2	0	2	6
Flowry Pekoe, ordinary	1	3	1	6	0	0	0	0
fair to good	1	6½	2	0	1	6	2	6
fine to finest	2	6	4	0	3	0	4	6
Caper, scented, in bxs.	0	9	2	1	0	11½	1	4
Orange Pekoe, plain..	0	9	0	10	1	0	1	4
scented	0	11	2	3	1	2	2	3
Twankay, ordy. Canton	0	0	0	0	0	8	0	0
common to good..	0	11	1	4	0	10	1	2
fine to Hyson kind.	1	5	1	6	1	3	1	4
Hyson Skin, common	0	10	1	0	0	8	0	11
good to fine	1	1½	1	4	1	0	1	1
Hyson, ordy. to comn.	1	8	1	10	1	4	1	8
fair to fine	2	0	2	6	1	9	2	6
finest	2	9	4	6	2	9	4	6
Young Hys. Boh. kind	0	0	1	0	0	9	0	10
good to fine	1	5	2	3	0	11	2	4
Imperial	1	6	2	2	1	0	2	2
Gunpowder	0	9½	3	9	0	11	3	9
Assam	1	2	4	6	1	7	4	6
TURPENTINE,								
Rough.... per cwt.	0	0	18	0	8	9	9	0
Spirits, English	60	6	0	0	30	0	0	0
American, in casks	61	6	0	0	31	6	0	0
WAX, Bees, English ..	£8	5	£8	10	£8	5	£8	10
German	8	0	8	15	8	0	8	5
American	9	0	10	0	8	10	10	0
white fine	10	0	10	10	10	0	10	15
Jamaica	8	10	9	10	8	15	9	0
Gambia	9	0	0	0	9	0	9	10
Mogadore	6	10	8	0	6	0	7	10
East India	7	10	8	10	8	0	9	0
ditto, bleached	9	0	10	10	9	0	10	10
vegetable, Japan	2	14	3	10	3	0	3	5
WOOD, DYE, bar, pr. tn.	3	5	0	0	0	0	0	0
Brazil, first quality	70	0	73	0	90	0	93	0
second quality..	55	0	60	0	60	0	63	0
logs	15	0	18	0	20	0	25	0
Braziletto	4	0	5	10	4	0	5	10
Camwood	16	0	20	0	24	0	26	0
Ebony, Green	7	0	8	10	9	10	10	0
Fustic, Cuba	8	0	9	0	8	15	0	0
Jamaica	5	15	6	5	5	0	5	5
Savanilla	5	0	5	10	5	0	0	0
Zante	7	0	9	0	6	0	8	0
Logwood, Campeachy	9	0	9	10	6	10	6	15
Honduras	6	0	6	5	0	0	0	0
St. Domingo	5	15	6	0	5	0	5	10
Jamaica	5	5	5	10	4	10	4	15
Nicaragua, lar. & sol.	8	10	0	0	11	0	12	10
small	7	10	0	0	0	0	0	0
Lima, first pile	8	0	9	0	13	10	14	5
second pile ..	7	0	7	15	12	10	13	0
Red Sanders	5	17	6	2 6*d*	5	15	5	17
Sapan, Bimas	6	10	8	0	6	0	8	10
Siam, &c.	7	0	9	0	6	0	9	10

PATENTS

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LETTERS PATENT.

DRUGS, CHEMICALS, ETC.

330 Jullion, J. L., Tynemouth, improvements in the treatment of soda waste and sulphurets.

INDIA RUBBER AND GUTTA PERCHA.

263 Chatterton, J., Highbury, improvements in treating gutta percha, india rubber, and compounds containing one or both of those substances, and in machinery or apparatus employed therein.

MISCELLANEOUS.

49 Hallett, G., Lambeth, and Stenhouse, J., Pentonville, improvements in the manufacture of pigments for coating surfaces.

58 Leroy, C. N., Paris, an improved grease for lubricating the frictional surfaces of machinery.

139 Townsend, J., and Walker, J., improvements in mordanting, and in the manufacture of products to be used as mordants, and otherwise.

170 Cooke, W., Charing-cross, improvements in apparatus for filtering.

215 Hallett, G., Lambeth, and Stenhouse, J., Pentonville, improvements in the manufacture of pigments for coating surfaces.

233 Fleming, W. F., Halifax, an improvement in bottle cleaners.

249 Phillips, H., Pinhoe, Devon, and Bannehr, J., Exeter, improvements in urinals, and in the manufacture of manure when urine is used.

284 Clark, W., Chancery-lane, improvements in instruments for testing the alcoholic strength of liquids.

309 Clark, W., Chancery-lane, improvements in preserving animal substances.

334 Jennings, J. G., Blackfriars, improvements in capsules or covers for the necks or ends of jars, bottles, and other vessels, and hollow tubes or bodies.

977 Smith, M., Birmingham, improvements in annealing pots or pans.

1204 Tooth, W. H., Rhodeswell-road, improvements in machinery or apparatus for reducing vegetable substances to a finely divided state, part of which improvements may also be employed for sifting or separating the fine from the coarse particles of other substances.

PROVISIONAL PATENTS.

DRUGS, CHEMICALS, ETC.

1611 McArdle, J. S., Galway, improvements in the treatment of sea weeds, for the purpose of obtaining therefrom certain valuable products.

1695 Spence, P., Newton Heath, improvements in economizing the manufacture of sulphuric acid, and in obtaining copper from ores used in such manufacture.

1726 Noble, A., Bristol, improvements in obtaining products from alkali waste and gas lime refuse.

INDIA RUBBER AND GUTTA PERCHA.

1580 Williams, J. F., Queen-square, improvements in compounds of india rubber and gutta percha with other substances.

MISCELLANEOUS.

1276 Ward, F. O., Mayfair, improvements in manufacturing manure and in obtaining accessory products.

1392 Mennons, M. A. F., Paris, an improved combination of metals for the production of a white alloy resisting the action of vegetable acids.

1428 Rust, J., Lambeth, an improved composition or preparation for hardening and preserving stone and cement.

1462 Roman, J., Liverpool, improvements in economizing fuel in evaporating and concentrating; chiefly applicable to the manufacture of chemicals, and in the apparatus connected therewith.

1556 McKay, M., Birmingham, an improvement or improvements in the manufacture of cements or adhesive solutions, for joining or connecting together surfaces or articles of leather, wood, paper, or other similar materials.

1582 Cullen, J., Bow, improvements in preserving wood and iron.

1596 Turner, G., Brompton, improvements in apparatus for beating eggs, and for mixing or agitating other fluids, compounds, or matters.

1636 Coulter, H., America, improvements in lamps specially intended to burn oils and other inflammable fluids rich in carbon.

1640 Cowan, J., Barnes, improvements in apparatus for reburning animal charcoal.

1651 Ford, A., Mortlake, improvements in the manufacture of waterproof felt.

1704 Wilson, T., and Tatters, J. G., Felling, improvements in treating tank refuse, or soda waste.

1709 Williams, O., Dursley, an improved mixture or liquid for extinguishing fire; applicable also for preparing or saturating various kinds of materials or fabrics, for the purpose of rendering the same non-inflammable.

1723 Ridsdale, J., Stoke Newington, improvements in inkstands; applicable to the stoppers of bottles.